

OHIO ASPHALT

THE JOURNAL OF ASPHALT PROFESSIONALS

ISSUE 1 • VOLUME 11
SPRING 2014

- 8 NCAT: RECALIBRATION OF THE ASPHALT LAYER COEFFICIENT
- 16 CAN MEDIATION SOLVE YOUR DISPUTE?
- 20 EXAMINING THE UNINTENDED CONSEQUENCES OF REFLECTIVE PAVEMENTS
- 26 POROUS ASPHALT PAVEMENT: HOW GOOD IS IT?
- 29 PORT COLUMBUS SOUTH RUNWAY RELOCATION CLEARS AIRPORT FOR GROWTH
- 30 RECLAIMING OHIO'S ASPHALT PAVEMENTS



Annual Event set
for March 25-26
Page 10

Asphalt ... Defining Value !
Safe, Smooth and Sustainable

OHIO RIDES ON US

Asphalt.



**WE DARE TO BE DIFFERENT,
SO YOU CAN BE YOUR BEST.**

For More Info
rdte.co/mc73C



We could tell you about the new innovative features on our paver like hydraulic swing out operator's stations or how we eliminated all the stacks to give you a clear view across the whole machine. We could talk about how we cut the noise level of the machine in half. But the thing that really separates us from the others is how we backed it up with the industry leading EDGE™ extended warranty. This is a 3 year, 3000 hour unlimited warranty that isn't prorated. Roadtec will reimburse you for your labor and covers everything but wear parts.

That's how we DARE TO BE DIFFERENT.



Standard Warranty:

1 YEAR OR 1,000 HOURS

EDGE™ Extended Warranty:

3 YEARS OR 3,000 HOURS

EDGE™ Engine Warranty:

5 YEARS OR 6,000 HOURS

ROADTEC an Astec Industries Company

800 MANUFACTURERS RD • CHATTANOOGA, TN 37405 USA • 800.272.7100 • FAX 423.267.7104 • roadtec.com



Want a smooth mat ... and a smooth operation?



Talk To Chuck.

Columbus Equipment Company has proudly served paving customers since 1953. Paving Division Product Support Specialist Chuck Amnah has been on the front line of this effort for over 20 years.

CONSTRUCTION • MINING • PAVING • LIFTING • ENVIRONMENTAL • COMPACT

Ask Chuck About Carlson Pavers Too!



Ohio's Dependable Dealer

DYNAPAC
Part of the Atlas Copco Group

Serving You From Ten Statewide Locations

Columbus	Toledo	Cincinnati
(614) 443-6541	(419) 872-7101	(513) 771-3922

Richfield	Cadiz	Dayton
(330) 659-6681	(740) 942-8871	(937) 879-3154

Canton	Zanesville	Painesville	Piketon
(330) 453-4521	(740) 455-4036	(440) 352-0452	(740) 289-3757

www.columbusequipment.com

OHIO ASPHALT

THE JOURNAL OF OHIO'S ASPHALT PROFESSIONALS

View the digital version at <http://ohioasphaltmagazine.com>.

- 6 THE PRESIDENT'S PAGE
- 8 NCAT: RECALIBRATION OF THE ASPHALT LAYER COEFFICIENT
- 10 2014 OHIO ASPHALT EXPO PROGRAM
 - 12 EDUCATION SESSIONS & SCHEDULE
 - 14 SPONSORSHIPS & EXHIBITORS
 - 15 BAILEY, McLEAN TO BE HONORED
- 16 LEGAL CORNER
 - CAN MEDIATION SOLVE YOUR DISPUTE?
- 20 RESEARCH UPDATE
 - EXAMINING THE UNINTENDED CONSEQUENCES OF REFLECTIVE PAVEMENTS
- 26 POROUS ASPHALT PAVEMENT: HOW GOOD IS IT?
- 29 PORT COLUMBUS SOUTH RUNWAY RELOCATION CLEARS AIRPORT FOR GROWTH
- 30 RECLAIMING OHIO'S ASPHALT PAVEMENTS SAVES DOLLARS AND THE ENVIRONMENT!
- 33 MARK YOUR CALENDARS
- 34 INDEX TO ADVERTISERS



CONNECT ON  

ON THE COVER: MORE THAN 400 ATTENDEES PARTICIPATED IN EDUCATION TRACKS, MEETINGS AND GENERAL SESSIONS AS WELL AS VISITED EXHIBITORS AT LAST YEAR'S OHIO ASPHALT EXPO. TO SEE WHAT'S SCHEDULED FOR THE 2014 EVENT, MARCH 25 & 26, SEE PAGE 10.



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

Ohio Asphalt is the official magazine of Flexible Pavements of Ohio. Published four times a year, advertising deadline is the 1st of the month preceding publication. Ohio Asphalt is not copyrighted and portions may be reprinted with the permission of Flexible Pavements of Ohio, 6205 Emerald Parkway, Suite B, Dublin, OH 43016; telephone: 614.791.3600, 888.446.8649; website: www.flexiblepavements.org

Officers

Chairman

Rodney Russell
Barrett Paving Materials Inc.

Co-Chair

Ty Nofziger
The Shelly Co.

Treasurer

Frank T. Bell
M & B Asphalt Co. Inc.

Board of Directors

Rob VanGorder
Kokosing Construction Company Inc.

Brent C. Gerken
Gerken Paving Inc.

James P. Jurgensen II
Valley Asphalt Corporation

Gerald N. Little
Shelly & Sands Inc.

Howard J. Wenger
Northstar Asphalt Inc.

Dean Wikel
Erie Blacktop Inc.

Staff

Clifford Ursich
President & Executive Director

William H. Fair
Director of Engineering Services

Andrew Gall
Director of Customer Relations

Florence H. Flowers
Executive Assistant

Contact

Telephone: 614.791.3600;
888.446.8649

Fax: 614.791.4800
www.flexiblepavements.org

Layout & Design

TriAd Marketing & Media

Ad Sales & Editorial Preparation

TriAd Marketing & Media
371 County Line Road West
Westerville, OH 43082
fax: 614.846.8763

Advertising Sales

Mark Wolf
mwolf@triad-inc.com or 866.679.9340

Editorial Staff

Jerry Marks
editorial@triad-inc.com or 800.288.7423

**Rudd service can
get to those
hard-to-reach places.
Like the ones
that don't exist yet.**



If there's one thing more hardworking and reliable than Rudd's equipment, it's Rudd's service and maintenance. Rudd's freight system and 13 service branches across nine states, together with our award-winning master technicians, mean we can deliver replacement parts, equipment and service to your site by the next morning. It's that kind of 24/7 service that proves how committed Rudd is to going the distance for you.

WWW.RUDDEQUIPMENT.COM

CALL: 1-877-DIG-RUDD



We go the distance.

Cleveland, OH 216-393-7833 • Columbus, OH 614-636-4050 • Cincinnati, OH 513-321-7833

THE PRESIDENT'S PAGE



CLIFFORD URSICH, P.E.
PRESIDENT & EXECUTIVE DIRECTOR

“Local governments have been among the hardest hit from the ‘Great Recession,’ having seen tax revenues drop sharply. Pavement conditions have dropped commensurately and cost of repairs loom large ...The passage of the SCIP renewal is without a doubt critical. It is one step forward for Ohio. Ohio voters need to know that a vote for SCIP renewal is an investment. SCIP dollars will invest in ‘bricks & mortar’-type projects; that is, projects that result in hard assets, jobs and economic prosperity – the kind of stuff worth investing in!”

Voters to Decide On Needed Revenue for Infrastructure

The fate of Ohio’s State Capital Improvement Program (SCIP) will be in the hands of voters this spring. In a similar way so is the fate of roads and bridges on Ohio’s county, township and municipal network, as voters choose to vote for or against the SCIP.

In May, voters will have the opportunity to renew the State Capital Improvement Program, currently listed on the May 6 ballot as Senate Joint Resolution 6 – Ohio Public Works Bond Issue. The SCIP, if passed, will provide a much-needed infusion of dollars to repair the state’s infrastructure. At stake is a nearly \$1.9-billion revenue stream for the purpose of financing or assisting in financing the cost of public infrastructure capital improvements of municipal corporations, counties, townships and other governmental entities as designated by law. Capital improvements eligible for grants under the SCIP are for roads and bridges, wastewater treatment systems, water supply systems, solid waste disposal facilities and infrastructure for stormwater control and sanitary collection. Monies will be obtained from bond issuance and used for acquisition, construction, reconstruction, expansion, improvement, planning and equipping.

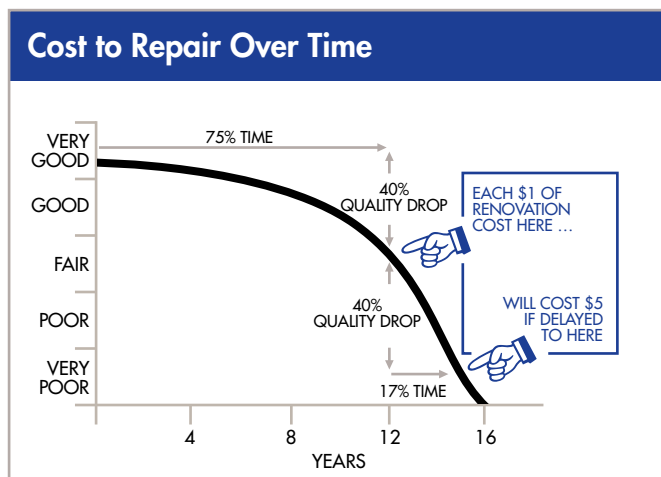
The SCIP renewal sets up a 10-year funding stream totaling \$1.875 billion. The funding level marks an increase over past capital improvement programs. The most-recent SCIP (2005) provided \$150 million annually. On the May ballot will be a SCIP

renewal that provides \$175 million in each of the first five years. In years six through 10, funding will be increased to \$200 million each year. The law provides for carryover of unspent monies to future years of the SCIP.

Local governments have been among the hardest hit from the “Great Recession,” having seen tax revenues drop sharply. Pavement conditions have dropped commensurately and cost of repairs loom large. A passage of the SCIP Renewal would provide sorely needed revenue for sorely needed repairs. A vote “FOR” passage of this renewal is of utmost importance.

HELP IS ON THE WAY – NOT AT ALL TOO SOON!

The timing of the SCIP legislation could not be better. In the summer 2013 issue of *Ohio Asphalt*, The President’s Page posed the question: “Which Will We Choose, \$1 for 75% or \$5 for 92%?” Provoked by the rapidly deteriorating conditions of local roads and lack of response to these conditions, the article explained the cost of deferred maintenance. Deferring maintenance means to put off doing



needed repairs to a future time. There is a cost associated with deferring road maintenance, as all motorists can see – and feel.

Pavements distress more quickly the longer they are used and not maintained. The cost associated with doing preventive maintenance is much less costly than doing rehabilitation. As the figure on page 6 indicates, the deterioration of a road from “VERY GOOD” to a “FAIR” condition rating, in general, consumes 75 percent of a pavement’s life. During that period of time, approximately 40 percent of the pavement’s usefulness has been expended (i.e. quality drop). If the owner of a pavement in “FAIR” condition takes action to restore the pavement to “VERY GOOD” condition, the cost associated with such will be one-fifth the cost of repairing the pavement had it fallen into “VERY POOR” condition.

IS IT HELP ENOUGH?

Local governments have the greatest number of pavement miles in Ohio, although many people might think that ODOT has the greatest number; likely because state roads and highways are most visible and most traveled. Truth is, miles of pavement on county and township roads in Ohio total 57,000, while ODOT mileage is just more than 19,000. Maintaining 78 percent of pavement miles in Ohio is the responsibility of the counties and townships.

When you start looking at the dollars the SCIP will provide for local roads and bridges – and all the other local government infrastructure – you’ll quickly realize that the SCIP provides good help. But more help is needed. As means of comparison, ODOT’s construction budget this year is \$2 billion; the SCIP will provide

\$1.9 billion over the next 10 years – if approved by the voters. The purpose in making that observation is to give perspective on the level of need. A long-term solution to funding Ohio’s road and bridge repairs remains an issue.

A CALL TO ACTION

The passage of the SCIP renewal is without a doubt critical. It is one step forward for Ohio. Ohio voters need to know that a vote for SCIP renewal is an investment. SCIP dollars will invest in “bricks & mortar”-type projects; that is, projects that result in hard assets, jobs and economic prosperity – the kind of stuff worth investing in!



Asphalt ... Defining Value!
Safe, Smooth and Sustainable

KMI KOKOSING MATERIALS, INC.
P.O. Box 334, Fredericktown, Ohio 43019
Phone: (740) 694-9585 • Fax: (740) 694-1100
www.kokosingmaterials.com

kokosing CONSTRUCTION COMPANY, INC.
P.O. Box 226, Fredericktown, Ohio 43019
Phone: (740) 694-6345 • Fax: (740) 694-1481
www.kokosing.biz

Asphalt plants located in the following Ohio cities:

Cleveland	Garfield Heights	St. Louisville
Columbia Station	Mansfield	Upper Sandusky
Columbus	Medina	Westerville
East Claridon	Sheffield	Woodville
Fredericktown		Wooster

Liquid AC terminals located in:
Wheelersburg, OH
Mansfield, OH

SBS Polymer manufacturing plant located in:
Mansfield, OH

Tradition ♦ Excellence ♦ Quality ♦ Innovation

Background

Although many highway agencies are exploring the use of new mechanistic-empirical pavement design methods, many currently still use the pavement design guide based on the AASHTO Road Test in Ottawa, Illinois, from 1958 to 1960. This test established an empirical relationship between traffic loading and pavement thickness. One of the key inputs to this method is the layer coefficient for the hot mix asphalt (HMA) layers. This HMA layer coefficient has not been updated in more than 50 years despite numerous improvements in mix design methods, quality control and construction of HMA.

Objective

The primary objective of this study was to recalibrate the asphalt layer coefficient based on current paving materials and construction using data collected at the NCAT Test Track accelerated pavement testing facility (Figure 1).



Figure 1. NCAT test track

Description of Study

In the first phase of the study, a sensitivity analysis was performed to determine the influence of design inputs on the resulting HMA thickness. A total of 5,120 design iterations were conducted as the inputs were varied. Analysis of these data showed that the layer coefficient was the most influential parameter on the resulting HMA thickness.

The second phase of the study involved recalibrating the asphalt layer coefficient using traffic and performance data from the structural sections of the 2003 and 2006 NCAT Test Track. Using the 1993 AASHTO Design Guide flexible pavement design equation, the predicted amounts of traffic in equivalent single axle loads (ESALs) were calculated to reach given levels of pavement serviceability. The predicted ESALs were compared to actual traffic on the sections. Least squares regression was performed to determine new asphalt layer coefficients for each section.

Key Findings

Figure 2 shows the computed layer coefficients for each section individually, as well as the average HMA layer coefficient of 0.54. Two test sections resulted in layer coefficients lower than the AASHTO recommended value of 0.44; however, forensic investigations showed that both sections had poor bonds between asphalt layers. No trends were observed relative to overall pavement cross-section, HMA layer thickness or binder grade.

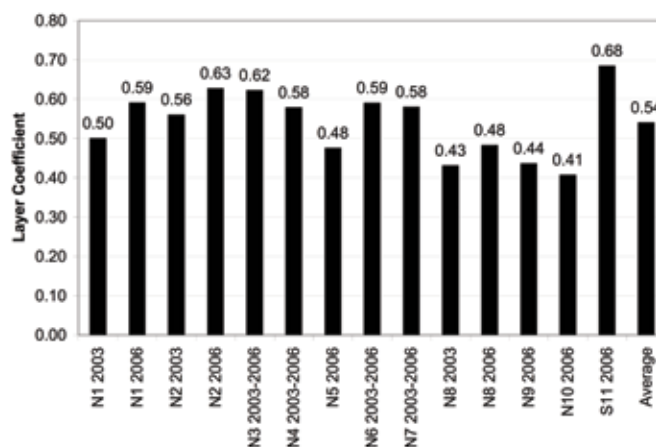


Figure 2. Computed layer coefficients for NCAT Test Track structural sections

The relationship between HMA layer coefficient and HMA modulus at 68°F is given graphically in the 1993 AASHTO Design Guide. This relationship can be modeled using a natural logarithmic function, allowing extrapolation for higher modulus values. When using the average HMA modulus value (backcalculated using falling weight deflectometer data) for the structural sections of the 2003 NCAT Test Track, this extrapolation yielded a corresponding layer coefficient of 0.543, which serves as additional validation of the 0.54 value in Figure 2.

Recommendations for Implementation

This study recommends an asphalt layer coefficient of 0.54 for flexible pavement designs using the AASHTO Design Guide. Increasing the coefficient will result in approximately 18 percent thinner HMA cross-sections. This translates directly into annual cost savings and/or more efficient use of HMA material to pave more highway mileage.

Care should be exercised when applying this coefficient in other states, as the recommended layer coefficient is based on the environmental conditions and materials used in this study.

Use of Layer Coefficient Would Result in Thinner, More Economical Asphalt Pavement

The 1993 American Association of State Highway and Transportation Officials' (AASHTO) *Guide for Design of Pavement Structures* is widely used by state and local road authorities. The guide's design protocol yields a "structural number" for asphalt pavement thickness design. The structural number is converted to pavement thickness by applying layer coefficients (an indicator of a material's strength) to the various materials composing the layers used to construct an asphalt pavement. Based on research conducted at the famous American Association of State Highway Officials road test (AASHTO Road Test) conducted in the 1950s, the AASHTO guide suggests an average layer coefficient of 0.44 for all asphalt mix types (Chapter 1.2).

The Ohio Department of Transportation (ODOT) uses a simplified version of the AASHTO 1993 *Pavement Design Guide* design protocol to determine the thickness of its pavements. ODOT conservatively

uses layer coefficients of 0.43 for asphalt surface and intermediate courses and 0.36 for asphalt base mixtures.

Much has changed in the production of asphalt mixtures in Ohio since the AASHTO Road Test, including the use of stiffer Superpave-designed asphalt mixtures and polymer-modified asphalt binders resulting in stronger materials than were previously available. The use of a layer coefficient of 0.54 as recommended in the NCAT study would result in thinner and more economical asphalt pavements. For example: A design structural number of 4.0 would require 10 ½ inches of asphalt pavement using ODOT's typical practice (3 ¼ inch surface and intermediate and 7 ¼ inch base). Using AASHTO's average layer coefficient of 0.44 would require 9 ¼ inches of asphalt pavement. Using the NCAT-suggested layer coefficient of 0.54 would require only 7 ½ inches of asphalt pavement to satisfy the pavement strength requirements.



DINE COMPLY INC.
ENVIRONMENTAL & SAFETY SPECIALISTS

WE CAN HELP

Environmental Audits
Air Permitting
Dispersion Modeling
Visible Emissions Testing
Water Permitting/Plans
Hazardous Waste Mgmt.
Oil Management/Plans
Record Keeping/Reporting
Permitting Strategy

Safety Audits (OSHA/MSHA)
Safety Training (OSHA/MSHA)
Training Needs Analysis
Accident/Incident Investigation
Safety Policies/Procedures
Safety Manuals
Job Safety Analysis
Facility Response Plans
Tank Integrity Testing

Dine Comply, Inc.

424 Newmans-Cardington Rd. E.
Marion, Ohio 43302
www.dinecomply.com
dine@rroho.com
(740) 389-2076

Free Consult!

Not the Biggest, Just the BEST!!



**Our Quality
and Service
is Unmatched
Since 1978**

- ♣ Asphalt Planing
- ♣ Micromilling
- ♣ Fine Milling
- ♣ Excavation — Up to 16.5"
- ♣ Bridge Deck Scarification
- ♣ Type 2 Rumble Strips



BOCA Construction, Inc.
380 Eastpark Drive, Norwalk, Ohio 44857
Office (419) 668-5575, Fax (419) 663-0377
An Equal Opportunity Employer

Visit www.bocaconstructioninc.com
for more on our services, capabilities, and history

IT'S TIME FOR OHIO'S PREMIERE ASPHALT EVENT

MARCH 25-26, 2014
HILTON COLUMBUS/POLARIS, COLUMBUS, OHIO
WWW.OHIOASPHALTEXPO.ORG



The Asphalt Expo is Ohio's premiere asphalt pavement event, featuring multiple, concurrent educational sessions and one of the largest indoor and outdoor trade shows and exhibitions in the region.

If you construct, inspect, manage or maintain local or private transportation infrastructure, the Ohio Asphalt Expo provides everything you need to ensure successful, long-lasting asphalt pavements.

Education Sessions

The Asphalt Expo features a variety of education sessions designed to improve your team's knowledge and help develop new skills.

More than a dozen educational presentations and workshops will be held over the event's two days, covering a wide range of topics impacting today's marketplace.

Networking Opportunities

The Expo's venue and format allow attendees ample opportunities to talk with other area contractors and producers to share ideas and experiences, as well as to meet with technical experts and other industry leaders.

With several formal events on the agenda – including the industry's annual Quality Paving Awards luncheon



and Chairman's Reception – and many other informal, impromptu gatherings, the Ohio Asphalt Expo is a great way to make contacts or stay connected with peers.

Exhibition and Trade Show

The Ohio Asphalt Expo also continues to bring together the area's largest collection of asphalt paving equipment, services providers and other vendors in one place, helping you keep ahead of the technology curve and providing you with direct access to key manufacturers.

This year's showcase will once again feature exhibits on all the latest products and exciting innovations that are creating the buzz right now in the industry, covering everything from asphalt laydown and production to pavement maintenance and traffic safety.

The equipment exhibition and trade show runs each day concurrently with the educational sessions and other events. It is free and open to all attendees.



Who Should attend the Ohio Asphalt Expo?

- Contractors
- Producers
- Specifiers
- Traffic Safety Professionals
- Plant Operators
- Public Officials



EDUCATION SESSIONS

This year's educational program promises to be one of the Ohio Asphalt Expo's best yet, offering several valuable sessions to help your business, from technical issues to generating new business.

Note: Program and featured speakers are subject to change.

TUESDAY, MARCH 25, 2014

7:30 AM - 9:00 AM

Public Agency Forum

A roundtable discussion among public agency officials and representatives of Ohio's asphalt industry, topics will center on the contracting and paving issues and rehabilitation of concrete streets. This forum will be chaired by Keith Earley, P.E., P.S., Lucas County Engineer.

FPO Membership Breakfast

NOTE: This is an FPO Member-only event.

9:30 AM - 11:00 AM

Education Session 1

- Longitudinal Joint Construction
- Segregation: Causes & Cures
Featuring Jim Scherocman, P.E., Consulting Engineer

The keynote speaker at Wednesday's Prayer Breakfast is Randy West, the director for the National Center for Asphalt Technology (NCAT) at Auburn University.



Education Session 2

- Maintaining Your Paving Equipment
Featuring Scott McLean and Doug McLean, The McLean Co.

Education Session 3

- Rethinking Asphalt Recycling
Featuring Richard Schreck, Virginia Asphalt Association
- Total Recycle Asphalt
Featuring Abdul Dahhan, Illinois DOT

Education Session 4

- Home Safe Tonight – Practical Safety Solutions
Featuring Curtis Hall, Independence Construction Materials
- Safety Tools for Supervisors & Managers
Featuring Gary Fore, ARTBA Consultant, and Emmett Russell, International Union of Operating Engineers

Education Session 5

- Legal Issues on Private Work
Featuring Don Gregory, Kegler, Brown, Hill + Ritter Co.
- Protecting Lien Rights & Collections
Featuring Andy Natale, Frantz Ward LLC

Noon - 2:00 PM

Quality Asphalt Paving Awards Luncheon

Join Flexible Pavements of Ohio as we recognize Ohio contractors and pavement owners for their excellence in 2013 for asphalt pavement construction.

2:30 PM - 4:00 PM

Education Session 6

- Improving Plant Efficiency
Featuring David Garrett, Meeker Equipment
- Understanding Plant Operations Using Warm Mix Asphalt
Featuring a representative of Astec Inc.



Education Session 7

- Best Practices for Commercial & Residential Paving
Featuring Scott McLean, The McLean Co.

Education Session 8

- Landing the Job by Pitching Asphalt
Featuring Mike Kvach, Asphalt Pavement Alliance

Education Session 9

- Methodology for Predicting Smoothness Results for the International Roughness Index (IRI)
Featuring Terry Humphrey, Caterpillar Inc.

Education Session 10

- Preventing Runover and Backover Fatalities during Road Construction
- Preventing Fatalities & Injuries during Night Work
Featuring Gary Fore, ARTBA Consultant, and Emmett Russell, International Union of Operating Engineers

5:00 PM - 7:00 PM

Chairman's Reception

Join us for an evening of fellowship and networking with the men and women of Ohio's asphalt industry.



**For Hotel
Reservations &
Information Visit**
www.hilton.com or
call (614) 885-1600

WEDNESDAY, MARCH 26, 2014

7:30 AM - 9:00 AM

Prayer Breakfast

The Prayer Breakfast is a long standing FPO tradition. Come celebrate and reflect on the accomplishments of the past year and look to the year ahead for Ohio's asphalt industry.

9:30 AM - 11:00 AM

Education Session 11

- Environmental Update
Featuring Shara Kay Hayes and Warren Wright, Dine Comply Inc.
- Plant Vessel & Piping Integrity Evaluation
Featuring Warren Wright, Dine Comply Inc.

Education Session 12

- Best Practices for the Construction of Porous Asphalt Pavements
Featuring Signe Reichelt, Behnke Materials Engineering
- Segregation: Causes & Cures
Featuring Jim Scherocman, P.E., Consulting Engineer

Education Session 13

- Polymer Binder Basics and Recent Innovations
Featuring Ron Corun, NuStar Asphalt LLC

Education Session 14

- Mix Optimization for Quality & Consistency
Featuring Shane Buchanan, Oldcastle Materials
- ODOT Update
Eric Biehl and Craig Landefeld, Ohio Department of Transportation

Asphalt Expo 2014 Sponsorships & Exhibitors*



Flexible Pavements of Ohio would like to recognize and thank our Asphalt Expo 2014 sponsors and exhibitors! Be sure to visit our more than 30 exhibitors on March 25 & 26

SPONSORSHIPS

Gold Level

Astec Inc.	Shelly & Sands Inc.
Barrett Paving Materials Inc.	The Shelly Company
Gerken Paving Inc.	Valley Asphalt Corp.
Kokosing Construction Co. Inc.	
M&B Asphalt Co. Inc.	
Marathon Petroleum Co. LLC	
Resource International Inc.	
Rudd Equipment Co.	

Silver Level

Asphalt Shingle Grinding Services LLC
Eagle Crusher Co. Inc.
Northstar Asphalt Inc.

Bronze Level

Central Allied Enterprises Inc.
Columbus Equipment Co.
Murphy Tractor & Equipment Co.
Southeastern Equipment Co. Inc.

Sustaining Level

Ohio CAT
Seneca Petroleum Co. Inc.

OUTDOOR EQUIPMENT EXHIBITORS

Columbus Equipment Co.
Ohio CAT
Rudd Equipment Co.
Southeastern Equipment Co. Inc.
The McLean Co.
HY-TEK JCB

INDOOR EXHIBITORS

Asphalt Materials Inc.
Asphalt Shingle Grinding Service LLC
Astec Inc.

BDI
BOCA Construction
Columbus Equipment Co.
DJL Material & Supply Inc.
Dine Comply Inc.
Eagle Crusher Co. Inc.
HY-TEK JCB
JASA Asphalt Materials/Russell Standard
JC Equipment Sales & Leasing Inc.
MOBA Corp.
Maxam Equipment Inc.
Meeker Equipment Co. Inc.
Meredith Brothers Inc.

Murphy Tractor & Equipment Co.
Ohio CAT
Quality Pavement Repair (QPR)
Reliable Asphalt Products Inc.
Ritchie Bros. Auctioneers
Roadtec
Roof to Road LLC
Rudd Equipment Co.
Southeastern Equipment Co. Inc.
Unique Paving Materials Corp.

*As of Feb. 26, 2014

FOR THE COMPETITIVE EDGE IN BIDDING



- Ohio's first ODOT certified supplier of RAS
- Recycling tear-off asphalt roofing shingles for more than a decade
- It's about as green as you'll get.
- For higher profit margins
- For more resilient pavement
- Secure supply of feedstock
- Multiple locations in Ohio and Kentucky



ROOF TO ROAD, LLC P: 740-986-6923 Cell: 614-419-0788 rooftoroad@aol.com

Bailey, McLean to be Honored at 2014 Ohio Asphalt Expo

Flexible Pavements of Ohio recently announced the 2014 recipients of its William W. "Bill" Baker and Industry Service honors, which will be awarded during the March 25-26 Ohio Asphalt Expo at the Hilton Columbus/Polaris.

A highlight of the annual event, FPO's individual award recipients will be honored during the Ohio Asphalt Expo's Prayer Breakfast, which will be held Wednesday, March 26 from 7:30 - 9 a.m.

FPO is proud to announce Robert Bailey as the recipient of the Baker Award and Scott McLean as the recipient of the Industry Service Award:



William W. "Bill" Baker Award
Robert Bailey,
Kokosing Materials Inc.

Including his time seal-coating driveways on a part-time basis as a high school and college student, the

2014 recipient of the William W. "Bill" Baker Award has been involved in the flexible pavements industry for 50 years. On his golden anniversary of industry involvement, Bailey is being awarded Flexible Pavements of Ohio's most-distinguished honor, which is named after the former FPO Inc. president who directed the association from 1976-91.

The Kokosing Materials president began his career with Williams Asphalt in Canton and worked with Northern Ohio Paving from 1977 until the company was purchased by Oldcastle Inc. in 2000. Bailey has served as Kokosing Materials president since 2000.

Along with serving as FPO chairman in 2012, Bailey has served the industry by being active in the Asphalt Institute for the past 10 years, with two stints on its Marketing Committee as well as the Commercial Member Representative on AI's Board of Directors and as the Associate Member Representative on its Executive Committee. As a volunteer, Bailey has also extensively served the Asphalt Pavement Alliance.



Industry Service Award
Scott McLean,
The McLean Co.

The third generation of his family to serve The McLean Co., Scott McLean's service to both FPO and the industry has led to him being the 2014

recipient of the Industry Service Award. This award was established in 2003 by the FPO Board of Directors and honors individuals' substantial contributions on association committees.

The company vice president, McLean is heavily involved in training and product support, as he has conducted training presentations and seminars for the World of Asphalt, Ohio Asphalt Expo, the Ohio Department of Transportation and other governmental entities.

McLean has worked with the family company since 1981, having worked in the service and parts department. As vice president of Sales, he focuses on after sales training and equipment support.

FPO invites you to this year's Ohio Asphalt Expo to help honor these individuals.





Can Mediation Solve Your Dispute?

By Donald W. Gregory, Esq. Kegler, Brown, Hill + Ritter Co., LPA

Both the American Institute of Architects (AIA) and ConsensusDOCS have created standard construction contracts that make mediation a prerequisite to litigation and arbitration.¹ Construction disputes are increasingly going to mediation, both as a result of this contractual requirement and a desire to avoid the high costs of litigation. This article will provide an introduction to mediation, will explore its advantages and disadvantages and will address issues unique to mediation in the construction industry.

INTRODUCTION TO CONSTRUCTION LAW MEDIATION

“Construction industry participants tend to seek out the most-efficient means of resolving their disputes. Minimal profit margins, harsh competition and overburdened work schedules make it paramount for construction contractors, design professionals and owners alike to resolve disputes in a timely and cost-effective manner before working relationships are negatively impacted. Indeed, these concerns have been a major driving force behind the construction industry’s widespread use of alternative forms of dispute resolution.”²

AIA and ConsensusDOCS construction contracts mandate American Arbitration Association (AAA) mediation as the first step in resolving disputes. The AAA has created well-defined procedures for construction mediation.³ Mediation is initiated when one of the parties makes a request to the AAA and notifies the other party.⁴ Next, the parties select a mediator. The AAA maintains a roster of professionals (including the author) that is browsable online.⁵ Parties may select a mediator, or allow the AAA to appoint one.⁶

The mediator’s role is somewhat different than that of an arbitrator or a judge in a settlement conference. First, the mediator’s goal is not to force a settlement.⁷ The mediator seeks to facilitate the flow of information and to foster a satisfactory resolution.⁸ Second, the mediator maintains the parties’ confidentiality.⁹ He or she agrees to refrain from testifying in subsequent proceedings,¹⁰ to restrict access to mediation sessions¹¹ and to keep no stenographic record of the mediation.¹² There is no filing fee for initiating mediation, but each mediator has an hourly rate listed on the AAA’s roster, with a four-hour minimum charge.¹³ The parties pay equal shares of the mediation expenses unless they agree otherwise.¹⁴



Don Gregory will be presenting an Education Session on “Legal Issues on Private Work” at the 2014 Ohio Asphalt Expo.

ADVANTAGES AND DISADVANTAGES TO MEDIATION

Mediation has several advantages over litigation and pre-trial settlement conferences. First, mediation can result in more flexible remedies, whereas judicial remedies are typically limited to money damages.¹⁵ Second, parties may be more candid with mediators than with settlement judges because there is no fear that the information will bias a later trial.¹⁶ Third, parties in mediation share facts cooperatively, saving time and money compared to expensive pre-trial discovery.¹⁷

Parties who seek to save time and money often choose mediation. The AAA says that mediated claims are typically resolved in under two months.¹⁸ By contrast, the organization cites federal court statistics putting the median length of construction trials at just under two years.¹⁹ Even the average mediated case with claims above \$500,000 is resolved nine months sooner than that.²⁰ In my experience, well more than 80 percent of construction disputes resolve themselves at mediation.

Federal court statistics also reveal the advantages of mediation over litigation. In 2006, the U.S. District Court for the District of Nebraska polled its attorneys and parties regarding their mediation and litigation experiences.²¹ That year, attorneys who resolved disputes in mediation reported saving an average of 104 hours per case, and attorneys and parties estimated that they saved almost \$60,000 per case.²² The respondents also answered questions aimed at measuring more qualitative advantages to mediation, like whether parties felt they had been treated fairly and whether they felt in control of and involved in the process.²³ Mediation scored well in all of these qualitative categories.²⁴

However, mediation is not without disadvantages. Clients and attorneys accustomed to adversarial judicial proceedings may bring counterproductive habits to mediation.²⁵ They may put more effort into persuading the mediator than the opposing party, or withhold information that could encourage settlement.

As contract documents often mandate mediation as a condition precedent to litigation or arbitration, parties can be forced into a mediation when one or more parties are not yet ready to resolve the dispute. This can lead to unnecessary delays while a fruitless mediation is conducted, which can lead to a hardening of settlement positions.

Furthermore, mediation is a bad fit for some cases. When the outcome of a case turns on a new legal question, mediation may not be appropriate.²⁶ Likewise, fundamental factual disputes — like the credibility of key witnesses — may also cause mediation to fail.²⁷ Finally, mediation may be impossible when the parties have lost all trust and ability to find common ground.²⁸ Such cases, however, are rare. Typically each party has an interest in maintaining a business relationship, and in resolving the dispute quickly. Mediation is an effective tool at achieving both.

SOME ISSUES TO CONSIDER WHEN ENTERING MEDIATION

A key to successful mediation is recognizing the ways it is unlike other forms of dispute resolution. Because mediation is non-binding and need not end in resolution, parties must approach mediation with a different mindset than that of litigation or arbitration.²⁹ They should avoid overzealous advocacy and instead come to mediation with the goal of solving problems creatively. A collaborative approach not only helps ensure the mediation's success; it also helps clients maintain their business relationships with adverse parties.³⁰

THE **shelly** **COMPANY**

The Shelly Company is the leading vertically integrated supplier of aggregates, asphalt, ready mix concrete and paving services in the state.



Quality Aggregates
Producing quality aggregates with more than 40 facilities statewide.



Ready Mix concrete element
Servicing customers with over 200 ready mix concrete trucks year round.



Asphalt paving crew
Paving with NAPA Diamond Achievement award-winning asphalt facilities and demonstrating our commitment to quality.



Lab tech testing asphalt
Providing experienced quality control labs with state of the art technologies.



Foreman and inspector
Ensuring customer service, community, safety and environment at the forefront of our business.

THE SHELLY COMPANY CORPORATE OFFICE

80 Park Drive • P.O. Box 266 • Thornville, Ohio 43076
Phone: (740) 246.6315 • Toll Free: (888) 743.5590 • Fax: (740) 246.4715

DIVISIONS OFFICES

Southern: (740) 246.6315 • Northeast: (330) 425.7861
Northwest: (419) 422.8854 • Ready Mix Concrete: (330) 364.4411

Shellyco.com • An Equal Opportunity Employer



IF YOU BELIEVE COLD MIX IS TEMPORARY YOU'RE NOT USING UPM®



BEFORE



9 YEARS LATER

UPM® is guaranteed to outlast the surrounding pavement when properly applied.

Our motto, "Once and Done" means just that. Never repair the same pothole again.



800.441.4880
UniquePavingMaterials.com
3993 E. 93rd St. Cleveland, OH 44105

Parties should also carefully consider the type of mediator they want to hire. While every mediator has a unique style, mediators generally break down into two categories: facilitators and evaluators.³¹ Facilitators use diplomacy to help parties communicate and find common ground. Evaluators provide analysis of each sides' strengths and weaknesses. To ensure their expectations are met, parties should investigate potential mediators' styles.³² Given the thorny nature of complex construction disputes and the personalities associated with such a "rough and tumble" industry, most experienced practitioners and parties favor a mediator with an evaluative approach.

CONCLUSION

It is rare to encounter a significant construction dispute that is not mediated at some point. Given the high costs of construction litigation, mediation is an important tool in any contractor's toolbox.

Don Gregory is the director and chair of Kegler, Brown, Hill + Ritter's Construction Law Practice. When he is not mediating, he can be reached at dgregory@keglerbrown.com.

- 1 ConsensusDOCS press release entitled, "Consensus Contract Documents Readies for Release" (sic). Available online at <http://www.consensusdocs.org/news/200707-enr.html>; Donald W. Gregory, A New Age of Consensus? Alignment Shattered by New Contract Documents, USGLASS, Volume 43, Issue 2, February 2008. Available online at <http://www.usglassmag.com/USGlass/2008/February/consensus.htm>.
- 2 Don Gregory and Peter Berg, CONSTRUCTION LAWYER: Problem or Problem Solver – Construction Lawyer, Volume 33, November 4, Fall 2013, at p. 16.
- 3 Construction Industry Arbitration Rules and Mediation Procedures, from the American Arbitration Association. Available online at <http://www.adr.orgsp.asp?id=22004#MedProcedures>.
- 4 Id. at section M-2.
- 5 Id. at section M-4.
- 6 Id.
- 7 Id. at section M-7.
- 8 Id.
- 9 Id. at section M-10.
- 10 Id.
- 11 Id. at section M-9.
- 12 Id. at section M-11.
- 13 Id.
- 14 Id. at sections M-16 and M-17.
- 15 Paul M. Lurie, Factors Influencing a Successful Mediation, CONSTRUCTION LAWYER, Volume 22, No. 3, Summer 2002, at p. 18.
- 16 Id.
- 17 Id.
- 18 American Arbitration Association white paper entitled, "Construction Industry Arbitration vs. Litigation: The Lines Aren't Drawn Where You May Think," at p. 2. Available online at <http://www.adr.org/si.asp?id=4538>.
- 19 Id.
- 20 Id.
- 21 United States District Court for the District of Nebraska 2006 Report on Mediation, at p. 6. Available online at <http://www.ned.uscourts.gov/mediation/medweb/report-06.pdf>.
- 22 Id. at p. 13.
- 23 Id.
- 24 Id.
- 25 Factors Influencing a Successful Mediation, supra, note 14, at p. 20.
- 26 Thomas J. Stipanowich and Douglas A. Henderson, Settling Construction Disputes by Mediation, Mini-Trial and Other Processes -- The ABA Forum Survey, CONSTRUCTION LAWYER, Volume 12, No. 2, April 1992, at p. 7.
- 27 Id.
- 28 Id.
- 29 James M. Bowie, Ethical Issues in Construction Mediation: Are There Any Rules?, CONSTRUCTION LAWYER, Volume 24, No. 2, Spring 2004, at p. 33.
- 30 Richard P. Flake and Susan G. Perin, Mediating Construction Disputes: What Works and What Doesn't, DISPUTE RESOLUTION JOURNAL, May/July issue, at p. 1. Available online at <http://www.adr.org/si.asp?id=2540>.
- 31 Bowie, Ethical Issues in Construction Mediation, supra, note 28, at p. 33.
- 32 Id.



PERFORMANCE

you can count on

Count on **Southeastern Equipment**

- Equipment when you need it
- Dependable service
- Extensive rental fleet
- Quick parts

Southeastern
Equipment Co., Inc.



Call today! Rental & Demos available

Ohio Locations

Brilliant
740-598-3400

Cambridge
740-432-6303

Gallipolis
740-446-3910

Monroe
513-539-9214

Perrysburg
419-874-0331

Marietta
740-374-7479

www.southeasternequip.com

Brunswick
330-225-6511

Dublin
614-889-1073

Heath
740-522-3500

North Canton
330-494-3950

Mansfield
419-529-4848

Mentor
440-255-6300

Examining the Unintended Consequences of REFLECTIVE

New research synthesis outlines multiple concerns with the reliance on reflectivity as a strategy for urban heat island effect mitigation

By Jiachuan Yang, Zhihua Wang, Ph.D., and Kamil E. Kaloush, Ph.D., P.E.
Copyright National Asphalt Pavement Association (USA, 2013)

Urban areas are dynamic places full of people, vehicles, and buildings. But with the concentration of people and built structures comes a phenomenon known as the “urban heat island effect” (UHI). These areas experience higher average temperatures when compared to surrounding rural areas due to heat absorbed by and stored within the built environment.

Scientific, legislative, health, and municipal efforts have been made to mitigate the inherent ability of the built environment to trap and hold heat. One UHI mitigation strategy that has gained popularity focuses on retrofitting urban surfaces with high-albedo or reflective construction materials, including reflective pavements.

A review of recent engineering and scientific research finds that while reflective surfaces can cool surfaces, there are substantial unintended consequences associated with widespread reliance on reflectivity to mitigate UHI due to the complexities of urban morphology and how ground-level reflections interact with pedestrians, vehicles, and the built environment.

TRANSFER OF ENERGY

Reflective surfaces have been traditionally considered for mitigating UHI

because they reflect solar radiation, and reduce the transfer of thermal energy into and through the material. However, greater reflected solar radiation will also be absorbed by surrounding surfaces and subsequently increases their temperatures.

Pearlmutter et al. (2006) showed that light-colored walls would reflect more short-wave radiation and generate a slightly higher heat gain for pedestrians based on a pedestrian-centered conceptual model. For example, increasing the albedo from 0.15 to 0.5 would substantially impact the comfort of people standing on the more reflective pavement, increasing the temperature they feel by 3° to 6°C (Lynn et al., 2009). Brender and Lindsey (2008) conducted experiments in Las Vegas and observed hotter interior temperatures (5°C at maximum) in the conduit over a white roof as compared to dark-colored roofs. Without proper design, this could result in serious overheating or even failure of electrical cables inside the conduit.

Ibrahim (2012) carried out a field study to explore the impact of roof color on ambient air temperatures and reported a significantly increased air temperature over a white-thermoplastic membrane roof. Pierce (2012) pointed out that the temperature of the membrane below a highly reflective wall surface could be 20°C higher in extreme cases. And results

PAVEMENTS

Additional findings from the research survey can be found in the full report, “Unintended Consequences: A Research Synthesis Examining the Use of Reflective Pavements to Mitigate the Urban Heat Island Effect,” which can be downloaded from the National Center for SMART Innovations at Arizona State University website, <http://ncesmart.asu.edu/news/unintended-consequences>. This article originally appeared in the January/February 2014 issue of *Asphalt Pavement Magazine*.



of experiments by Li (2012, as part of the Lawrence Berkeley National Laboratory (LBNL) research effort on reflective pavements) implied that the temperature of the building wall would be heated up by the reflected energy from the pavement surface, which could be 2° to 5°C higher around noon. Subsequently, the increased temperature makes air conditioning units work harder, accelerates the heat aging of the membrane, damages surrounding building components, and causes heat discomfort for pedestrians. This effect causes potential problems for the high-density urban areas where building components are in close proximity to each other (Li, 2012).

In addition to its impact on the thermal environment to surrounding buildings, reflected solar radiation increases potential health risks on humans. High reflectivity from light-colored surface can increase the intensity of indirect ultraviolet (UV) radiation to people. UV radiation is harmful to living cells and can result in sunburn, increase the rate of aging of the skin, and skin cancer, with its damage accumulating over years (CCOHS, online source).

Childhood sun exposure may play an important role in the development of skin cancer later in adult life. Therefore the amount of reflected radiation should be taken into consideration when planning for ground

and building pavements, especially in schoolyards and playgrounds (CDC, 2011).

Moreover, reflective pavement surfaces with a light color can cause glare and visual pollution, which can harm eyesight after a long period of exposure. Reflection from light-colored surfaces can disturb occupants of taller neighboring buildings when applied to roofs (LBNL, online source), make pedestrians on nearby sidewalks suffer when applied to walls (Marvin, 2013), and provide less lane demarcation due to the poor visibility of white lines when applied to light-colored roads, potentially increasing driving risks (City of Chula Vista, 2012).

At night, reflective pavements can have the unintended consequence of increasing light pollution. Shaflik (2007) notes that 35 percent to 50 percent of all light pollution is estimated to be attributable to roadway lighting and that 95 percent of light directed toward pavements is reflected upwards at reflectance rates that range from 6 percent for asphalt to 25 percent for concrete. A recent study by the International Dark-Sky Association at the Brecon Beacons National Park found asphalt surfaces can reduce the upward light reflected by half when compared to concrete surfaces, regardless of luminaire light distribution (James, 2013).

LOST BENEFITS

In colder climates and during wintertime, the tendency of darker surfaces to absorb solar energy can have benefits that are lost with more reflective surfaces. The lower surface temperature of reflective roofs slows the melting of snow and ice, making the roof more susceptible to deeper snow, ice, and icicle formation (Carter and Stangl, 2012). Similarly, the lower surface temperature of reflective pavements in the winter increases maintenance costs and environmental impacts associated with ensuring a safe winter roadway or walkway in colder climates.

Because reflective pavements have lower surface temperatures (MnDot, 2013), additional deicing salts are required to ensure clear winter roadways (TranSafety, 1997) and the safety of the traveling public. In fact, at pavement temperatures below 15°F, the use of deicing salts on snow-covered roadways are not as effective and additional chemicals are required (MnDOT, 2013). Use of deicing chemicals is costly and may have negative environmental impacts to nearby soils, vegetation, water, and vehicles (TranSafety, 1997).

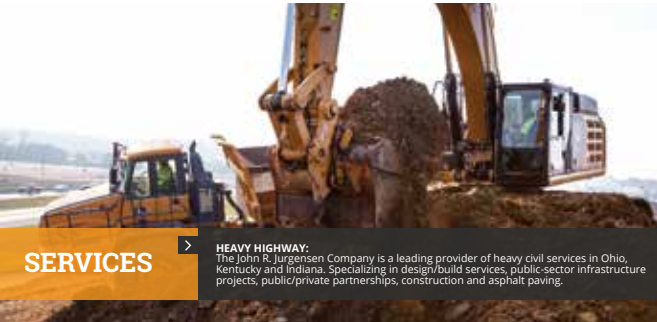
Research has also identified a potential heating penalty for buildings next to reflective surfaces. According to the Commercial Buildings Energy

Consumption Survey by U.S. Energy Information Administration (2003), heating accounts for 36 percent of commercial buildings' annual energy consumption, while air conditioning only accounts for 8 percent in the United States. The U.S. Green Building Council (USGBC) also identifies that across the United States, more energy is consumed heating buildings than used to cool them (Enlink Geoenergy, 2012).

In climates with less than 1,000 cooling degree days (CDD), Akbari and Konopacki (2005) found that reflective surfaces, including reflective pavements, can negate any summertime electricity savings due to wintertime heating penalties. Wintertime heating penalty must also be considered as an unintended consequence of reflective pavements, as indicated by Li (2012).


ENERGY COST

Proponents of reflective surfaces for UHI mitigation have deduced that hundreds of billions of dollars in savings due to reduced cooling energy demands can be realized through the deployment of reflective pavements. A review of the simulations, however, identifies the use of unrealistic assumptions, and the findings have not been confirmed by other modeling efforts or field studies.



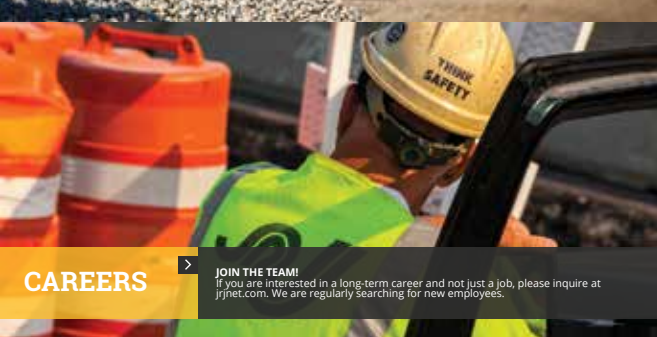
SERVICES

HEAVY HIGHWAY:
The John R. Jurgensen Company is a leading provider of heavy civil services in Ohio, Kentucky and Indiana. Specializing in design/build services, public-sector infrastructure projects, public/private partnerships, construction and asphalt paving.




PRODUCTS

AGGREGATE:
Jurgensen Aggregate crushed stone is sold throughout Ohio, Indiana, and Kentucky. Our limestone and crushed stone products are used in a wide variety of construction applications as well as in the asphalt, concrete and construction industries.




CAREERS

JOIN THE TEAM!
If you are interested in a long-term career and not just a job, please inquire at jrjnet.com. We are regularly searching for new employees.



John R. Jurgensen
COMPANY



**A TALENTED AND DEDICATED TEAM OF PROFESSIONALS
CREATING INFRASTRUCTURE FOR THE ROADS YOU TRAVEL**

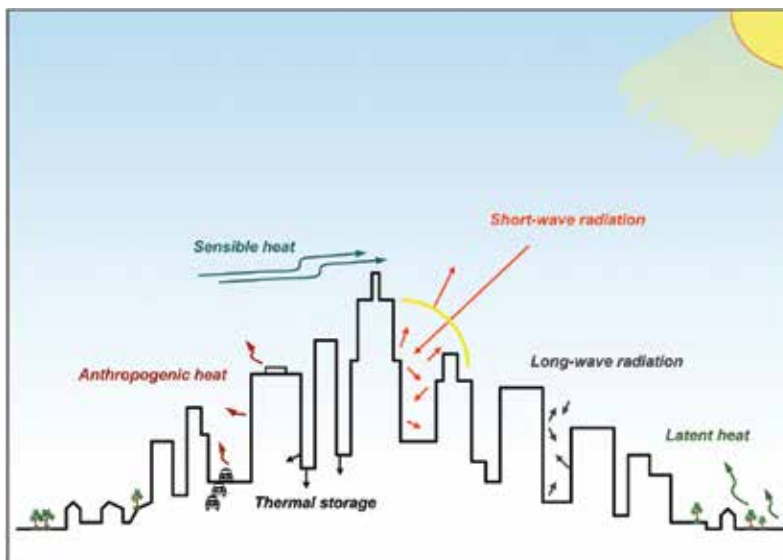
11641 Mosteller Road • Cincinnati, Ohio 45241
513.771.0820 • jrjnet.com

In real situations, optimization of building energy usage in urban areas is a complicated problem that requires understanding of the complex interaction between urban morphology, materials, and climates.

Intuitively, while reflective roofs may reduce building cooling loads by minimizing the transfer of heat through a relatively thin membrane in an elevated urban spatial location, the same is not necessarily true with regards to pavements as they function in different spatial locations (at grade), often are obscured by urban geometry (e.g., large buildings), and do not directly transfer heat into a building.

Yaghoobian et al. (2010) applied a three-dimensional heat transfer model (TUF3D) and found a substantial reduction in short-wave radiative heat transfer from ground to building by using low-albedo ground surfaces. This reduction leads to a consequent savings in the daily design cooling load of nearby buildings by 17 percent using low-albedo pavements. Later in 2012, Yaghoobian and Kleissl (2012) adopted a three-dimensional building-to-canopy model (TUF-IOBES) to investigate the effects of reflective roofs on energy usage. Focusing on the physical interactions between buildings and surrounding microclimate in the urban canyon, the study found that increasing ground pavement solar reflectivity from 0.1 to 0.5 near a four-story office building (1,820 m² floor area, 47 percent window-to-wall ratio) in Phoenix would increase annual cooling loads up to 11 percent (33.1 kWh/m²).

These results illustrate the potential of increased cooling loads in adjacent buildings by reflected solar radiation from high-albedo reflective surfaces. Additionally, Ryu and Baik (2012) identified heat radiating from building walls as having a greater impact on nighttime temperatures than heat radiating from horizontal surfaces. If reflective pavements add to heat storage in vertical surfaces, this effect would be intensified.



Schematic of surface heat budgets in a built environment (USEPA, 2008). Note that in particular the solar (short-wave) radiation experiences multiple reflections between adjacent urban facets, which results in the so-called “radiative trapping” phenomenon in urban areas.

CONCLUSION

Recent field studies and modeling efforts have found that while reflective surfaces can have an effect on surface temperature, there is no discernible difference in 5 feet above-surface air temperature over sizeable pavement test slabs with differing albedos. (Li, 2012; Pourshams-Manzouri, 2013) Furthermore, other recent studies found that reflected radiation from high-albedo pavements can increase the temperature of nearby walls and buildings, increasing the cooling load of the surrounding built environment and increasing the heat discomfort of pedestrians.

The methodology in addressing UHI mitigation should look at a well-balanced pavement design that considers the geographic region, climatic conditions, and UHI factors, such as material density, thermal mass, reflectivity and thermal properties. The answer to UHI mitigation does not lie in one single factor or approach. Without further detailed investigations, specification and deployment of only highly reflective



FRANTZ WARD LLP

ATTORNEYS AT LAW

Result-Oriented and Reliable Legal Assistance for the Construction Industry

Arbitration and Mediation · Litigation · Claims Management and Avoidance
Competitive Bidding · Schedule Disputes · Defective Work and Design Claims
Project Delivery · Mechanics' Liens and Collection · Labor and Employment Services

• Contact: Andrew J. Natale •

127 Public Square - 2500 Key Center - Cleveland, Ohio 44114-1230 - 216.515.1660 - FAX 216.515.1650 - www.frantzward.com

pavements to mitigate UHI are premature due to the unintended and adverse consequences associated with the redirected solar radiation.

Jiachuan Yang is a doctoral student in the School of Sustainable Engineering and The Built Environment (SEBE) at Arizona State University (ASU). Zhibua Wang, Ph.D., is an Assistant Professor in the SEBE and is the co-director for Climate Systems Research in the National Center of Excellence for SMART Innovations at ASU. Kamil E. Kaloush, Ph.D., P.E., is an Associate Professor in the Department of Civil, Environmental and Sustainable Engineering and the Director of the National Center of Excellence for SMART Innovations at ASU.

REFERENCES

- Akbari H, Konopacki S. 2005. Calculating energy-saving potentials of heat-island reduction strategies, *Energy Policy*, 33(6):721–756.
- Brender D, Lindsey T. 2008. Effect of rooftop exposure in direct sunlight on conduit ambient temperatures. *IEEE Transactions on Industry Applications*, 44(6):1872–1878.
- Canadian Center for Occupational Health and Safety (CCOHS). Skin Cancer and Sunlight.
- Carter M, Stangl R. 2012. Considerations for building design in cold climates. *Whole Building Design Guide*.
- Centers for Disease Control and Prevention (CDC). 2011. Shade planning for America's schools.
- City of Chula Vista. 2012. Cool roof study final report.
- Heat Island Group, Lawrence Berkeley National Laboratory (LBNL). Cool science: Cool roofs.
- Energy Information Administration. 2003. Commercial Buildings Energy Consumption Survey. U.S. Energy Information Administration.
- Enlink Geoenery. 2012. Overview of geothermal heat pump systems. U.S. Green Building Council, Nevada.
- Ibrahim S. 2012. Black vs. White: Energy Performance and Cold Climate Concerns. *International Roofing Expo*, Anaheim, CA, Feb. 22–24.
- James HP. 2013. Brecon Beacons National Park International Dark Sky Reserve lighting management plan.
- Li H. 2012. Evaluation of Cool Pavement Strategies for Heat Island Mitigation. PhD dissertation, Univ. of California, Davis.
- Lynn BH, Carlson TN, Rosenzweig C, Goldberg R, Druyan L, Cox J, Gaffin S, Parshall L, Civerolo K. 2009. A Modification to the NOAA LSM to Simulate Heat Mitigation Strategies in the New York City Metropolitan Area. *J. Appl. Meteor. Climatol.* 48(2):199–216.



51 YEARS EXPERIENCE

- Commercial, private, & government contracts
- Asphalt producer
- Aggregate producer (limestone, sand & gravel)
- Milling & grinding
- Excavation, grading, culverts & pavement repairs
- Decorative thermoplastic & asphalt products



StreetBond
Coating Systems for Asphalt

THE GERKEN COMPANIES

9-072 County Road 424 • Napoleon, Ohio 43545
Ph# 419-533-7701 • Fax# 419-533-5393

TRACKBOND50

StreetPrint
Genuine Stamped Asphalt

WWW.GERKENCOMPANIES.COM

Marvin S. 2013. Reflective pavement, solution or direction? League of California Cities Planning Commissioners Academy, Pasadena, CA, Feb. 27–Mar. 1.

Minnesota Department of Transportation (MnDOT). 2013. MnDOT District 1 2013 Winter State Highway Maintenance White Paper — Fact Sheet.

Pearlmutter D, Berliner P, Shaviv E. 2006. Physical modeling of pedestrian energy exchange within the urban canopy. *Build. Environ.*, 41(6):783–795.

Pierce HH. 2012. Unintended consequences! Keeping alert to protect single-ply roofs. *Interface*, 30(2):20–24.

Pourshams-Manzouri T. 2013. Pavement temperature effects on overall urban heat island. MS Civil and Environmental Engineering thesis, Arizona State Univ., Tempe.

Ryu YH, Baik JJ. 2012. Quantitative analysis of factors contributing to urban heat island intensity. *J. Appl. Meteor. Climatol.*, 51(5):842–854.

Shaflik C. 2007. Environmental effects of roadway lighting. Univ. of British Columbia, Dept. of Civil Engineering, Vancouver.

TranSafety. 1997. Using Salt and Sand for Winter Road Maintenance. *Road Management & Engineering Journal*.

U.S. Environmental Protection Agency (USEPA). 2008. Reducing urban

heat islands: Compendium of strategies.

Yaghoobian N, Kleissl J, Kravynhoff ES. 2010. Modeling the thermal effects of artificial turf on the urban environment. *J. Appl. Meteor. Climatol.*, 49(3):332–345.

Yaghoobian N, Kleissl J. 2012. Effect of reflective pavements on building energy use. *Urban Climate*, 2:25–42.

OA



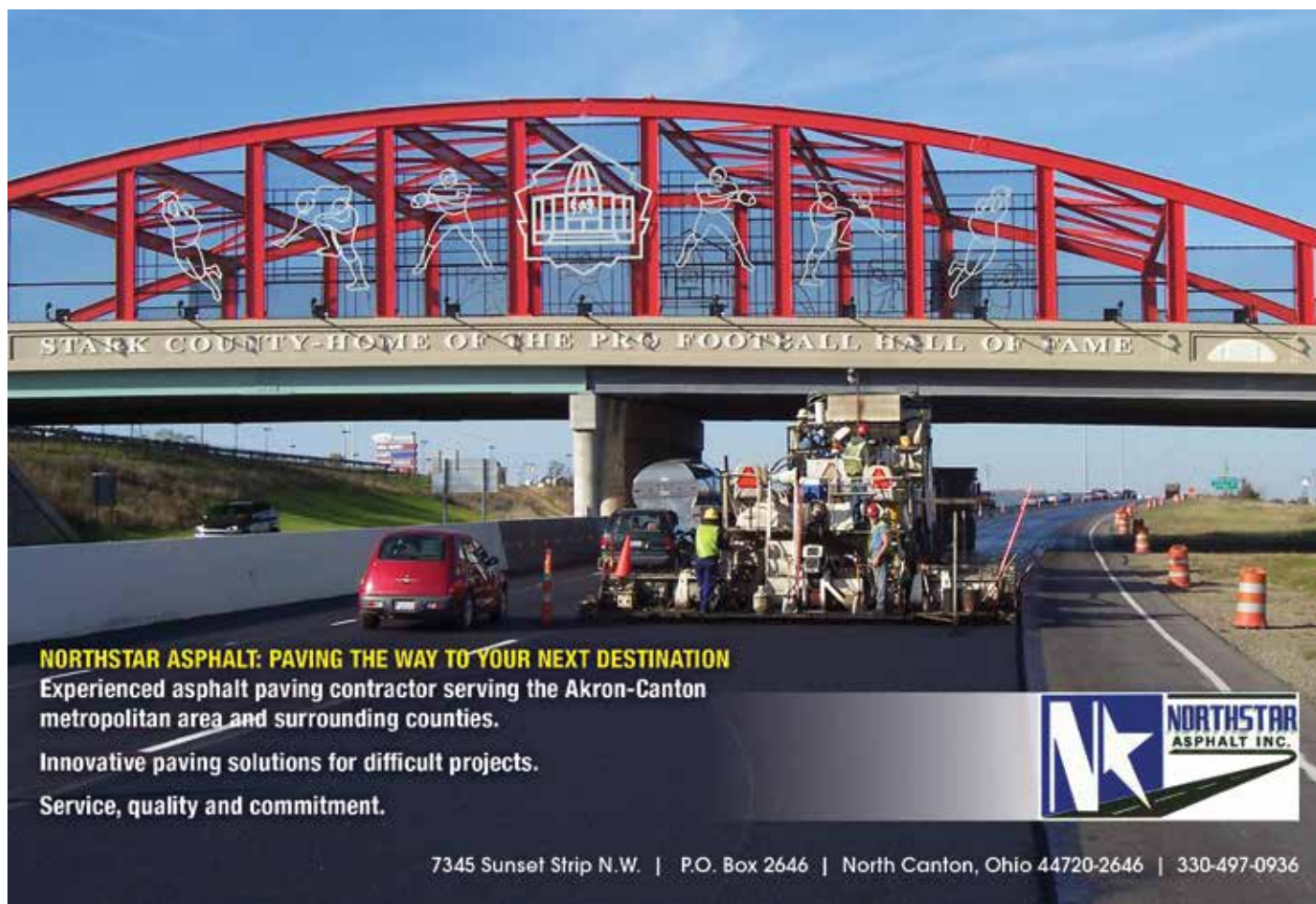
Reliable.

Resourceful
Responsive

Three Offices in Ohio
(800) 593 7777 terracon.com

Terracon

Geotechnical ■ Environmental ■ Construction Materials ■ Facilities



NORTHSTAR ASPHALT: PAVING THE WAY TO YOUR NEXT DESTINATION

Experienced asphalt paving contractor serving the Akron-Canton metropolitan area and surrounding counties.

Innovative paving solutions for difficult projects.

Service, quality and commitment.

NORTHSTAR ASPHALT INC.

7345 Sunset Strip N.W. | P.O. Box 2646 | North Canton, Ohio 44720-2646 | 330-497-0936

Porous Asphalt Pavement – How Good Is It?

Interest in porous asphalt pavement has been gaining favor as this system is showing good promise in reducing stormwater runoff, reducing pollution and replacing expensive detention and treatment facilities. Porous pavement systems are being viewed by designers and regulators as an economical approach to stormwater management for sustainable or low-impact development. This article discusses performance and economy of this system.

A PRIMER

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. Porous asphalt pavement is constructed over a stone-filled reservoir to collect and store stormwater 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.

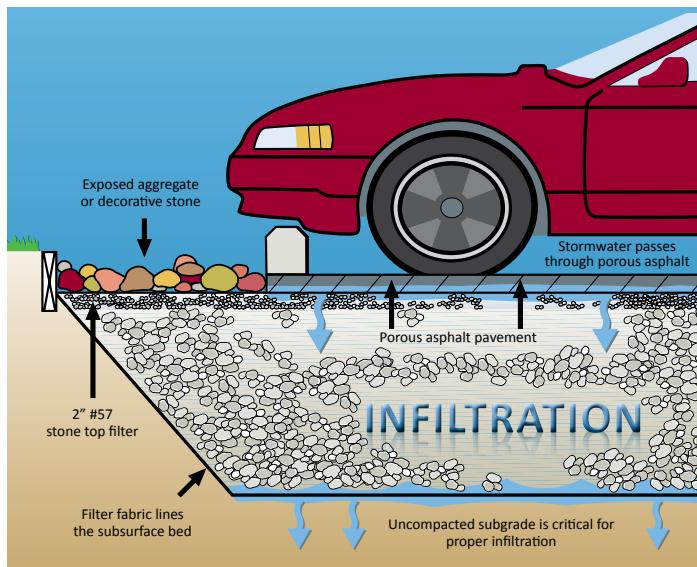


Figure 1 - Porous Pavement Recharge Bed Concept

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, stormwater regulations, site runoff and stormwater quality requirements. Frost penetration depth is also a factor in determining reservoir-course thickness.



Figure 2 - Cuyaboga Valley National Park, Brandywine Falls Multi-use Path, Summit County, Ohio.

A typical porous asphalt pavement recharge bed design consists of two porous asphalt courses, a top filter/stabilizing 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.

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. The differences are that porous asphalt materials must be protected from contamination that would tend to plug its pores, and the finished pavement must have 16 to 20 percent air-void content. Porous asphalt materials will cool more rapidly than conventional asphalt mixes, making it necessary to closely monitor pavement compaction.

Maintaining permeable pavements requires ensuring vegetation debris or anything that could reduce porosity is removed through timely maintenance.

Typical applications for porous asphalt have been commercial and industrial parking facilities for automobiles and light-duty trucks, residential roadways, multi-use paths and green alleys.

POROUS ASPHALT PAVEMENT PERFORMANCE

Porous asphalt pavements demonstrate a significant capability to capture and infiltrate stormwater runoff. A dramatic display of this capability came in 2013 when flooding hit Colorado. Record-setting rainfall in Boulder sent

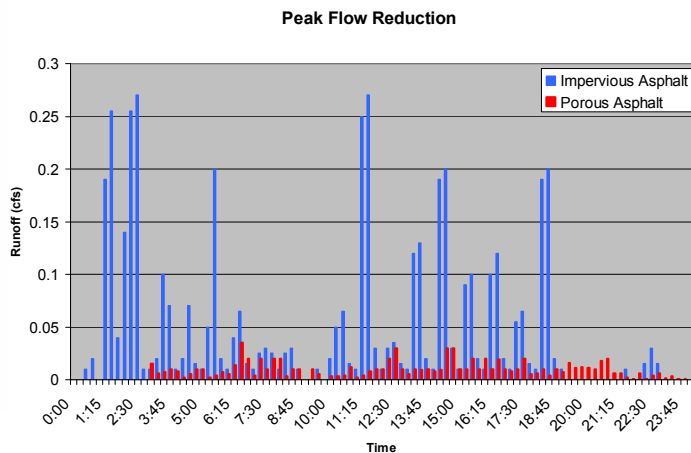


Figure 3 - Transit Authority of Northern Kentucky Park & Ride, 2007

stormwater flows to destructive proportions. Parking facilities constructed of porous asphalt and designed to infiltrate stormwater demonstrated a capacity to infiltrate both rainfall deposited on the pavement and stormwater sheet flow off adjacent non-permeable pavement. In a much-less dramatic fashion, yet one telltale of the infiltration capability of porous asphalt, the Transit Authority of Northern Kentucky constructed and instrumented a porous asphalt pavement park-and-ride lot. Constructed in 2007 over what had been classified as poor draining soil, the facility saw a volume reduction in stormwater runoff of 75 percent. Peak flows were reduced from 0.27 cubic feet per second (cfs) to 0.04 cfs. Observations of porous asphalt pavements constructed over near non-permeable soil indicate some infiltration does occur.

POLLUTANT REMOVAL PERFORMANCE

Research conducted by Cahill, Adams & Marm in 2005 evaluated pollutant-removal efficiency of porous pavements designed for stormwater infiltration. Stormwater was evaluated for 14 pollutant parameters: Average removal efficiency (%) for Total Suspended Solids (TSS): 91; Total Phosphorus (TP): 66; Total Nitrogen (TN): 72; Total Organic Compounds (TOC): 86; Lead (Pb): 74; Zinc (Zn): 81; Metals: 90; Bacteria: 90; Biological Oxygen Demand (BOD): 75; Cadmium (Cd): 33; Copper (Cu): 42; Total Kjeldahl Nitrogen (TKN): 53; Nitrate: 27; and Ammonia: 81. The University of New Hampshire Stormwater Center (UNHSC) ranked 12 stormwater infiltration technologies for TSS removal efficiency; porous asphalt demonstrated 99 percent TSS.

COLD WEATHER PERFORMANCE

The performance of porous asphalt pavements is a common question. Porous asphalt durability, the ability for the pavement to continue pollutant removal in cold weather, and snow and ice control are the typical interests.

The American Society of Civil Engineers' (ASCE) *Journal of Environmental Engineering* published the following research, "Water Quality and Hydrologic Performance of a Porous Asphalt Pavement as a Storm-Water Treatment Strategy in a Cold Climate." The study examined the functionality of a porous pavement stormwater management system in coastal New Hampshire, where six months of subfreezing temperatures typically occur. Porous asphalt was monitored for hydraulic and water-quality performance from 2004 to 2008. Research conclusions indicate

significant frost penetration was observed up to 71 cm (approximately 28 inches) without declines in hydrologic performance or observable frost heave. Adverse freeze-thaw effects, such as heaving, were not observed, and for that reason, the lifespan is expected to exceed that of typical pavement applications in northern climates. Peak flow was reduced by 90 percent ... in comparison with standard impervious cover. There was exceptional water-quality treatment performance for petroleum hydrocarbons, zinc and total suspended solids, with nearly every value below detection limits. Only moderate removal was observed for phosphorous, and treatment for nitrate was negative.

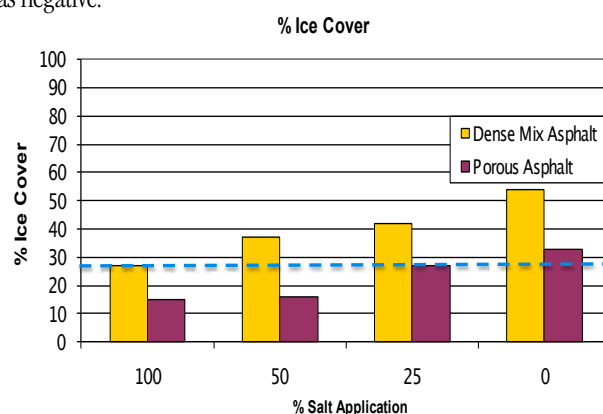


Figure 4 - Source: University of New Hampshire Stormwater Center (UNHSC)

Snow & Ice Control for porous asphalt pavements is dissimilar to conventional asphalt pavements. Porous asphalt pavements used for parking lots have shown less need for salt. UNHSC has evaluated both conventional asphalt pavements and porous asphalt pavements for percent ice cover vs. percent salt application. A 75-percent reduction in salt application was observed. Salt reduction amounts are site specific and affected by degree of shading. The exception occurs when mixed precipitation and compact snow or ice is present on the porous surface. The color of the asphalt facilitated ice melt and the pavement porosity provided immediate removal of snow melt. Snow melt from the conventional pavement froze creating a slick surface condition.

POROUS PAVEMENT LONGEVITY

Porous asphalt pavement longevity is indicated by two measures: permeability of the pavement and wear resistance. Porous asphalt pavements have shown the ability to retain permeability for as long as

30 years. Permeability longevity will depend upon the success of an owner's pavement maintenance strategy. Any deposition of debris onto the pavement must be removed prior to migration into the pavement pores. Debris from vegetation or pulverized aggregate loosened from the pavement surface will compromise permeability. Non-regenerative vacuuming is a necessary maintenance strategy and should be conducted routinely. The frequency will depend on proximity of vegetation, type of vegetation, pavement surface resistance to tire scour and landscaping practices. The Ohio Department



of Natural Resources "Ohio Rainwater and Land Development Manual" suggests the development of a maintenance plan as part of a permeable pavement installation.

Porous pavement structural life should exceed that of conventional pavement. The thick, stone base and drainage properties of porous asphalt supersede conventional pavement. They are stronger and better drained.

POROUS PAVEMENT ECONOMY

The porous pavement concept can provide a long-term, economical solution for low impact development (LID). Research conducted by Rosseen, Janeski, Simpson, Houle, Gunderson and Ballesterio, titled "Economic and Adaptation Benefits of Low Impact Development," makes the following claims and case studies:

"LID is commonly misperceived as only adding expense to a project; however, this perspective fails to acknowledge the broader capital benefits that can be observed in terms of whole project costs for new construction, and in some instances, increased life-cycle benefits."

"Specifically, utilizing LID can result in project cost savings by decreasing the amount of required, expensive, below-ground drainage infrastructure and reducing or eliminating the need for other stormwater management-related facilities."

Case study: Residential Development (Boulder Hills, N.H.):

- 14-acre residential development
- Design included rooftop infiltration trenches, porous asphalt driveways, porous asphalt sidewalks and New Hampshire's first porous asphalt road
- 6-percent reduction in site development expenses (\$49,000 less) as compared to the conventional option
- Savings found in reduced drainage infrastructure, site clearing and erosion control

Case study: Commercial Development (Greenland Meadows, N.H.):

- Large commercial retail facility with three franchise stores (home improvement, department, and grocery)
- 38.4-acre site; estimated usage of 10,000 vehicles per day
- Design included:
 - 4.5-acre porous asphalt installation (largest in Northeast)
 - Subsurface gravel wetland and storage of rooftop runoff
- Savings: 26-percent reduction in site development expense equating to \$930,000
 - Reduced earthwork; 10,500 feet less of 36- and 48-inch pipe

Project costs vary based on many factors, such as the size of project; a larger project with larger quantities attracts lower prices. Design assumptions having impact on the project cost include: design rain event, soil permeability and technology to be employed (infiltration or detention). The choice to design a porous pavement to infiltrate versus detain stormwater will affect recharge bed depth and associated material quantities. Excavation depth and layer thickness of porous asphalt base and surface course mixtures are also cost factors. The list is not exhaustive nor does it include engineering costs.

CONCLUSIONS

Porous asphalt pavements are efficient. Strengths of porous pavements include the capability to be designed either as an infiltration or detention stormwater control system. Research demonstrates that porous pavements have effective stormwater quality control and can reduce stormwater discharges and peak flows. Quality of water treatment is high in both warm and cold climates with effective pollutant removal. Porous asphalt is suited to take advantage of asphalt paving construction efficiencies, including quick construction, labor and equipment costs. By using a multi-layered asphalt pavement, porous asphalt pavements are designed for the future to avoid reconstruction if surface permeability is compromised. Porous asphalt has been demonstrated as providing a cost-effective alternative to conventional stormwater management practices.



JASA High Performance Cold Patch (JASA HP-5)

- Workable in sub-zero temperatures
- Permanently repairs potholes
- Compatible with limestone or gravel (#9)
- Available year round for pick-up or delivery
- Can be manufactured in AC plant (w/no heat) or;
- Can be manufactured on site with our pugmill

JASA Asphalt Materials / Russell Standard Corp.

"A name you can trust since 1989 (ODOT Certified)"

Manufacturing asphalt emulsions, cutbacks and specialty products

990 Hazel Street ■ Akron, OH 44305 ■ Tel.: 330-733-9400 ■ www.jasarussell.com



Port Columbus South Runway Relocation Clears Airport for Growth



The fall 2008 issue of *Ohio Asphalt* contained an article titled, "Port Columbus Runway 10R/28L Packing Up, Moving South." It reported on an ambitious proposal by the Port Columbus Regional Airport Authority to relocate the south runway to comply with post-

9/11 security requirements and allow the airport to expand operations and passenger capacity. Officially known as the Runway 10R/28L Replacement Project, this \$140-million endeavor was the largest capital investment in the 85-year history of the airport authority and was completed in 2013 after more than four years of construction.

The south runway replacement project consisted of the construction of a new 10,113-foot-by-150-foot-wide runway with two, 25-foot shoulders, and required the demolition of several airport structures and the redesign and modification of the city-owned Airport Golf Course. Commissioned in August 2013, the new south runway, located 702 feet from the original runway, provides sufficient clearance from the north runway to allow simultaneous arrivals and departures, increasing airport capacity while also providing developable land for the construction of a second passenger terminal. The existing south runway, which was a patchwork of pavement types dating back to the original 1928 pavement, was converted to a taxiway as part of this project.

ASPHALT: THE PAVEMENT CHOICE OF PORT COLUMBUS

Asphalt had long been the material of choice for Port Columbus paving projects dating back to the mid-1960s, when maintenance overlays of the existing concrete pavements were performed. A pavement Life Cycle Cost Analysis (LCCA) for the south runway relocation was performed and the airport selected 16 inches of asphalt on 11 inches of stone with a 12-inch stabilized subgrade as the typical section for this project. It was noted by the Port Columbus engineering staff that asphalt's "ease of maintenance" was a critical factor in the selection of pavement type.

A SUCCESSFUL PAVING PARTNERSHIP

This project was the result of a unique partnership between two of Ohio's largest asphalt contractors. Shelly & Sands Inc. was the prime contractor for this project with The Shelly Company as a key partner. The pavement was constructed in conformance with Federal Aviation Administration (FAA) specifications. Shelly & Sands placed all the base mixes and The

Shelly Co. paved the surface mixes for the entire project. Both contractors provided their own mix designs and testing; however, the asphalt mix produced for this project was provided by Shelly & Sands Asphalt Plant Division, Mar-Zane Materials.

The project required more than 400,000 tons of asphalt and was the first, full-depth asphalt runway at a large commercial service airport in more than a decade. With a strict project schedule and two contractors responsible for paving operations, close coordination and communication became the keys to the successful completion of the project. The contractors paved at night whenever possible and utilized two pavers in an echelon formation to provide better overall pavement smoothness and an improved longitudinal joint. Their diligent efforts resulted in pavement noted for its smoothness and average density of 98 percent.

AWARD-WINNING PAVEMENT

The Port Columbus Regional Airport Authority has a rich history of utilizing asphalt pavements, which have been recognized with paving awards for quality asphalt design and construction by both the National Asphalt Pavement Association (NAPA) and Flexible Pavements of Ohio (FPO). The Runway 10R/28L Replacement Project is no exception. This project was recognized at NAPA's 59th Annual Meeting with a Quality in Construction Award and will be recognized with a Quality Asphalt Pavement Award by FPO at the 2014 Ohio Asphalt Expo.

OA



THE ONE STOP SHOP FOR ALL YOUR ASPHALT NEEDS

VISIT OUR WEB SITE AT:
WWW.ASPHALT-MATERIALS.COM



Reclaiming Ohio's Asphalt Pavements Saves Dollars and the Environment!

By David E. Newcomb, P.E., Ph.D., Texas A&M Transportation Institute

Congratulations Ohio! You are in the top tier of states using reclaimed asphalt pavement (RAP) and reclaimed asphalt shingles (RAS). This is exciting news because taking advantage of the opportunity to recycle has a number of advantages to the environment, pavement owners and contractors. Environmental benefits include a reduction of the carbon footprint of the pavement and any of its end uses, and conservation of natural resources and landfill space – making asphalt paving an excellent sustainability practice. From an economic standpoint, the reuse of materials provides an opportunity to stabilize construction prices, which may fluctuate as the economy and demand for raw materials change. The technology for using increased amounts of RAP in asphalt mixtures has improved significantly in terms of mix design and material processing and handling. Finally, the long-performance history of RAP mixtures over the last 40 years and RAS over the last 20 years provides confidence that, appropriately done, using recycled materials in mixtures can provide the same or better level of service than virgin asphalt mixtures.

In terms of environmental benefits, the greater the quantity of RAP and RAS that is used will the lower the resulting energy consumption, as shown below in Figure 1 (Robinette and Epps, 2010). These savings are relative to producing a new virgin mixture. For a mix containing 25 percent RAP, the amount of energy saved is on the order of 9 to 10 percent. For a mix with 5 percent manufacturer's waste asphalt shingles (MWAS) the energy savings is about 5 percent, and for tear-off asphalt shingles (TOAS) this amounts to about 12 percent-less energy consumed. These energy savings translate into substantial savings in the amount of greenhouse gases that are generated in CO₂ equivalence (CO₂eq) as shown in Figure 2. It can be seen that the greenhouse gas reduction is proportional to the amount of energy savings.

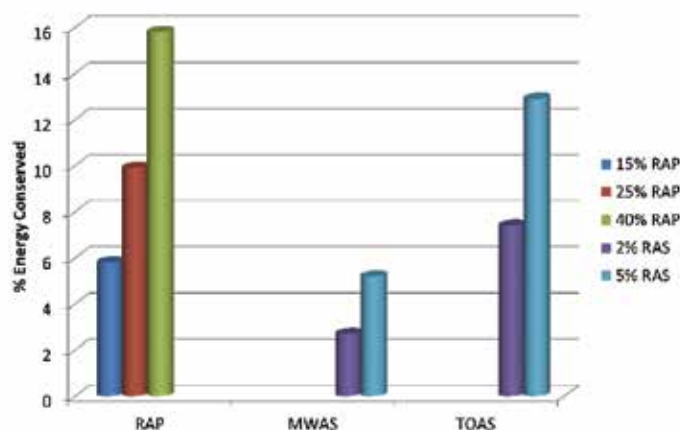


Figure 1. Energy Savings from Various Amounts of RAP and RAS. (Robinette and Epps, 2010)

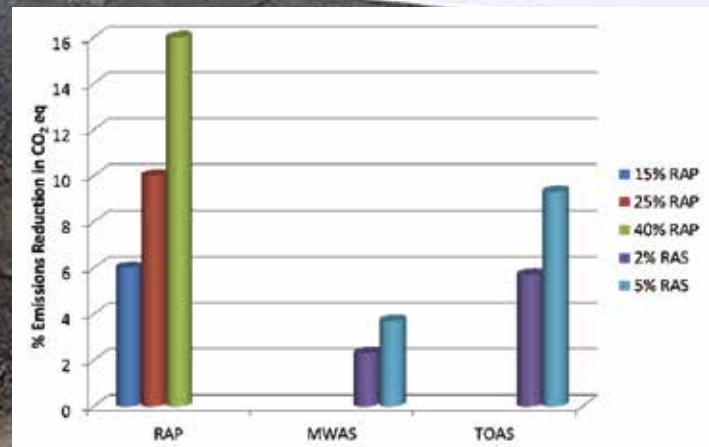


Figure 2. Emissions Reductions from Various Amounts of RAP and RAS. (Robinette and Epps, 2010)

According to the National Asphalt Pavement Association's annual survey (Hansen and Copeland, 2013) of asphalt mix producers, the total amount of RAP and RAS used in the U.S. has increased dramatically over the last few years. The total tonnage of mix produced went from 358 million tons in 2009, to 366 million tons in 2011. The average amount of RAP used in mixtures across the country went from 16 percent to 18 percent for an increase of 10 million tons. Between 2009 and 2011, RAS incorporated into asphalt mixtures went from 701,000 tons to 1.19 million tons, an increase of 70 percent. Assuming an average asphalt binder content of 5 percent for RAP and 20 percent for RAS, this means that the total amount of binder saved in 2011 was about 3.5 million tons. At a cost of about \$500/ton, that means a total savings of about \$1.8 billion nationally.

At an average RAP content of 24 percent in asphalt mixtures, Ohio ranks 7th among states in its reuse of asphalt pavement. In 2011 a total Ohio tonnage of 15.4 million tons of mix produced, this means that about 3.9 million tons of RAP was used and about 175,000 tons of asphalt binder, worth about \$90 million, was saved from RAP use alone. Additionally, Ohio has been a leader in the use of RAS, being one of 20 states that allowed the use of roofing shingles in mixes for all three years. In 2011, a total of 10,580 tons of RAS was used in the state. Assuming a RAS binder content of 5 percent, this amounts to 2,100 tons of asphalt saved, which equates to about \$1 million.

With the continually fluctuating price of crude oil, RAP and RAS will become increasingly important resources to stabilize the price of asphalt pavements. RAP and RAS use helps stabilize the price of asphalt mixtures, since the aggregate and asphalt are already captured and are not subject to the same volatility as other construction materials. Generally speaking, the

cost to obtain and process RAP is about four to six times less than that of raw materials. Thus, increasing the amount of RAP in a mix by 10 percent provides appreciable savings – not only to the contractor but also to the customer.

While the economic benefits provide a powerful motivation for the use of RAP and RAS, it is important to maintain the performance of asphalt pavements. Concerns over the use of high-RAP and high-RAS content mixtures come largely from a few experiences in the 1970s and 1980s, when mix production was not controlled as well as it is today. The primary issues that have been raised include:


- Durability
- Consistency of RAP and RAS
- Stiffness of the RAP and RAS binder
- RAP aggregate degradation
- Extent of blending between virgin and replacement binder

All of these issues can be handled through proper mix design, material processing and production. Each of these will be addressed below.

Durability problems in mixes can be related to many factors, including the volume of effective asphalt binder in a mixture, asphalt binder properties, in-place mix density, and conditions during placement. The volume of effective binder in any asphalt mixture is critical to aggregate coating and mixture cohesion. Most mix-design procedures cover this aspect by specifying the

aggregate gradation and the volumetrics of the mix. The aggregate gradation in a RAP/RAS mixture is just as important as in a virgin mixture, and gradation standards need to be maintained to make sure that there are not excess fines. The RAP/RAS binder is a portion of the effective binder in that it coats the RAP aggregate and interacts with the new binder in coating the new aggregate. The amount of new binder needs to be sufficient to coat the virgin aggregate and blend with the RAP/RAS binder to provide the needed cohesion. The gradation and volumetric standards that apply to virgin mixtures should be applied to RAP/RAS mixtures. With proper mix design, material processing and production practices, a high-RAP-content asphalt mix can provide the same long-lasting durability as a virgin asphalt mixture.

The blending of RAP/RAS binder and virgin binder is necessary to provide the cohesion needed in the mixture to preclude premature cracking and raveling. If the asphalts mix well with one another, the dispersion of RAP/RAS binder in the virgin binder occurs so that the needed mix strength develops. Solubility depends on how close the substances are in chemical compatibility, the proportion of new asphalt in the blend, and the temperature at which they are mixed. Blending theory says that materials that have chemical compositions and molecular weights close to one another generally mix better than those that do not. RAP/RAS binder and virgin binder that originate in the same general area usually pose no problems in the two products being compatible, but there are notable exceptions, and historical records should always be consulted. Where high





Valley Asphalt
A JURGENSEN COMPANY

**A LEADER IN PRODUCING & PROVIDING
HOT & WARM MIX ASPHALT PRODUCTS**

We are dedicated to our customers with quality and service as our No. 1 goal. Valley Asphalt provides modern, high production Asphalt Plant facilities with knowledgeable and respected support teams.

11641 Mosteller Rd. Cincinnati, OH 45241 Phone: (513) 771-0820 jrjnet.com



levels of binder replacement (above 30 percent) are being used, it may be of benefit to consider the use of a rejuvenating agent, especially with RAS. Contractors in Missouri have begun using rejuvenating agents to improve blending between recycled and virgin materials. This is achieved by spraying them on the RAS or RAP on the conveyor ahead of introducing it in the mixing chamber, which helps provide better blending. The temperature in the pugmill or drum needs to be sufficient for the aged binder to be mobilized, and this may occur at temperatures well below the standard hot-mix temperatures of 280°F to 320°F for RAP. However, the use of RAS, particularly from tear-off shingles, may require higher plant temperatures.

In the past, the amount of fines generated in producing RAP severely limited the amount of RAP that could be introduced into an asphalt mixture. These fine particles are generated from the milling or crushing operations used in reclaiming the material. In general, milling results in a higher production of fine materials, but with modern methods of material processing and handling, fines no longer pose the problems they did in the past. These improvements in processing include dust removal systems in plants and sizing or fractionating RAP materials so that consistency is maintained in the mix gradation.

It is recommended that specified mix gradations be maintained, regardless of whether a mix uses all virgin materials or contains RAP. This is because screening can be used to separate the RAP into two or three separate sizes and allows for greater control of the final mix gradation. The finest size will contain sand-sized particles and smaller, and it will have the highest asphalt content. This size is ideal for use in fine aggregate gradations, and will be particularly useful in thinlay (thin overlay) applications. Larger RAP sizes can be used in larger, nominal, maximum-aggregate-size asphalt mixtures. The separation of RAP into different sizes allows much greater flexibility and can lead to greater amounts of RAP being used.

As with any aggregate stockpile, greater separation will increase control and reduce the amount of variability in the final product. If only one RAP stockpile is used, it is much more difficult to control the resulting gradation at higher RAP contents, and adjustments for the variability will have to be made in the virgin aggregate. Using two or three stockpiles of RAP

fractionated by size, in conjunction with multiple RAP cold feed bins, will result in much tighter gradation control to meet end-product criteria.

Although the technology for recycling asphalt mixtures has been around since the 1970s, innovations that have occurred since then have refined our understanding of mix design, material handling, mix production, construction and performance of RAP/RAS mixtures. The improved technology has resulted in opportunities to allow more binder replacement from RAP and RAS to be used in asphalt mixtures. The asphalt binder and aggregate in RAP and RAS are high-quality materials that are as valuable as the natural resources they replace. The use of RAP and RAS in asphalt mixtures provides an excellent means to provide some stability in construction material prices. RAP and RAS mixtures can provide high-performance pavements and are known for their rutting resistance.

In order to use more RAP and RAS in asphalt mixtures, it is vital that quality standards be maintained through specifications. RAP and RAS mixtures should be able to meet all requirements of virgin asphalt mixtures. Adjustments in mixture-design procedures should allow for the means to maximize RAP and RAS usage. Innovations in materials handling and mixture production, which allow for high-binder-placement mixtures of high quality, should be encouraged so that producers have the greatest flexibility in providing the most economical high-quality materials.

References:

Hansen, K. and A. Copeland. April 2013. 2nd Annual Asphalt Pavement Industry Survey on Reclaimed Asphalt Pavement, Reclaimed Asphalt Shingles, and Warm-Mix Asphalt Usage: 2009-2011. Information Series 138. National Asphalt Pavement Association. Lanham, Md.

Robinette, C. and J. Epps. 2010. Energy, Emissions, Materials Conservation and Prices Associated with Construction, Rehabilitation and Material Alternatives for Flexible Pavement. Transportation Research Board. Washington, D.C.

David E. Newcomb, P.E., Ph.D., is the senior research scientist at the Texas A&M Institute.



New Utility Compactors Added to Paving Product Family

- Simple Operation
- Efficient Compaction Performance
- Best-In-Class Water Spray System
- Optimized Power
- Designed for Rental



For more details contact Bob Toney at 614.464.7824
www.OhioCAT.com



Mark Your Calendars



2014 Ohio Asphalt Expo March 25-26, 2014

Columbus/Polaris Hilton Hotel
8700 Lyra Dr.
Columbus, Ohio 43240

The Asphalt Expo is Ohio's premiere 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.ohioasphaltexpo.org for additional information or to register for this event.

Field Quality Control Supervisor Training April 15, 2014

Crowne Plaza Hotel Dublin
600 Metro Place N.
Dublin, Ohio 43017

This seminar provides the training required to become approved to perform the Field Quality Control Supervisor (FQCS) function on ODOT projects, or to acquire re-approval after five years since the previous training. Achieving FQCS approval will also satisfy newly revised ODOT specifications that require individuals who take and handle cores to hold either FQCS or level 2 or 3 asphalt technician status.

Course Content:

- Introduction and review of the purpose of the FQCS program
- Overview of quality control and quality assurance
- Review of ODOT specifications, testing supplements, supplemental specs, proposal notes, ethical considerations and typical asphalt construction problem issues

Go to www.flexiblepavements.org for additional information or to register for this training.



Asphalt Shingle Grinding Service, LLC

Right Product, Right Price, First Time, First Pass

Be Part of the
RASolution!

Recycled Asphalt Shingle
Sales and Production

Nationwide Mobile Grinding
and Crushing Service

877-679-5708

www.AsphaltShingleGrinding.com



Think Green, Be Green, Make More Green

ADVERTISERS INDEX

Asphalt Materials Inc.	29	J.C Equipment Sales & Leasing Inc.....	IBC	Shelly & Sands Inc.	34
Asphalt Shingle Grinding Service LLC.	33	John R. Jurgensen Company.....	22	Southeastern Equipment Company Inc.	19
BOCA Construction	9	Kokosing Construction Company Inc.	7	The Shelly Company	17
Columbus Equipment Company.....	3	The McLean Company.....	BC	Terracon.....	25
Dine Comply Inc.	9	Northstar Asphalt Inc.	25	Unique Paving Materials.....	18
Frantz Ward LLP.....	23	Ohio Cat.....	32	Valley Asphalt Corporation	31
The Gerken Companies.....	24	ROADTEC	IFC		
JASA Asphalt Materials/ Russell Standard Corp.	28	Roof to Road LLC.....	14		
		Rudd Equipment	5		

TO ADVERTISE IN OHIO ASPHALT

CALL TRIAD 866.679.9340 • email: mwolf@triad-inc.com



Shelly & Sands, Inc. Building on a Long History of Quality Construction

Asphalt Materials & Paving • Construction Aggregate
Liquid Asphalt & Emulsions • Construction Management
Site Development • Design Build



Since 1944, from locations throughout the state, Shelly & Sands has been safely and efficiently delivering the highest quality construction materials and projects in Ohio and Ohio's neighbor states.



Contact us today to let us know how we can earn the opportunity to assist you in making your project a success.

Corporate Headquarters
3570 South River Road • P.O. Box 1585 • Zanesville, Ohio 43702-1585
740 453-0721 • www.shellyandsands.com



It's all about your
productivity and profit!

IT'S ALL ABOUT THE PLUS

-  3D Machine Control Specialists
-  Expert Installation
-  Unparalleled Field Support
-  3D Modeling Software
-  Paver Systems
-  Pocket 3D
-  Laser Sales & Service
-  Instrument Sales & Service
-  Millimeter GPS

Our biggest 
is our people

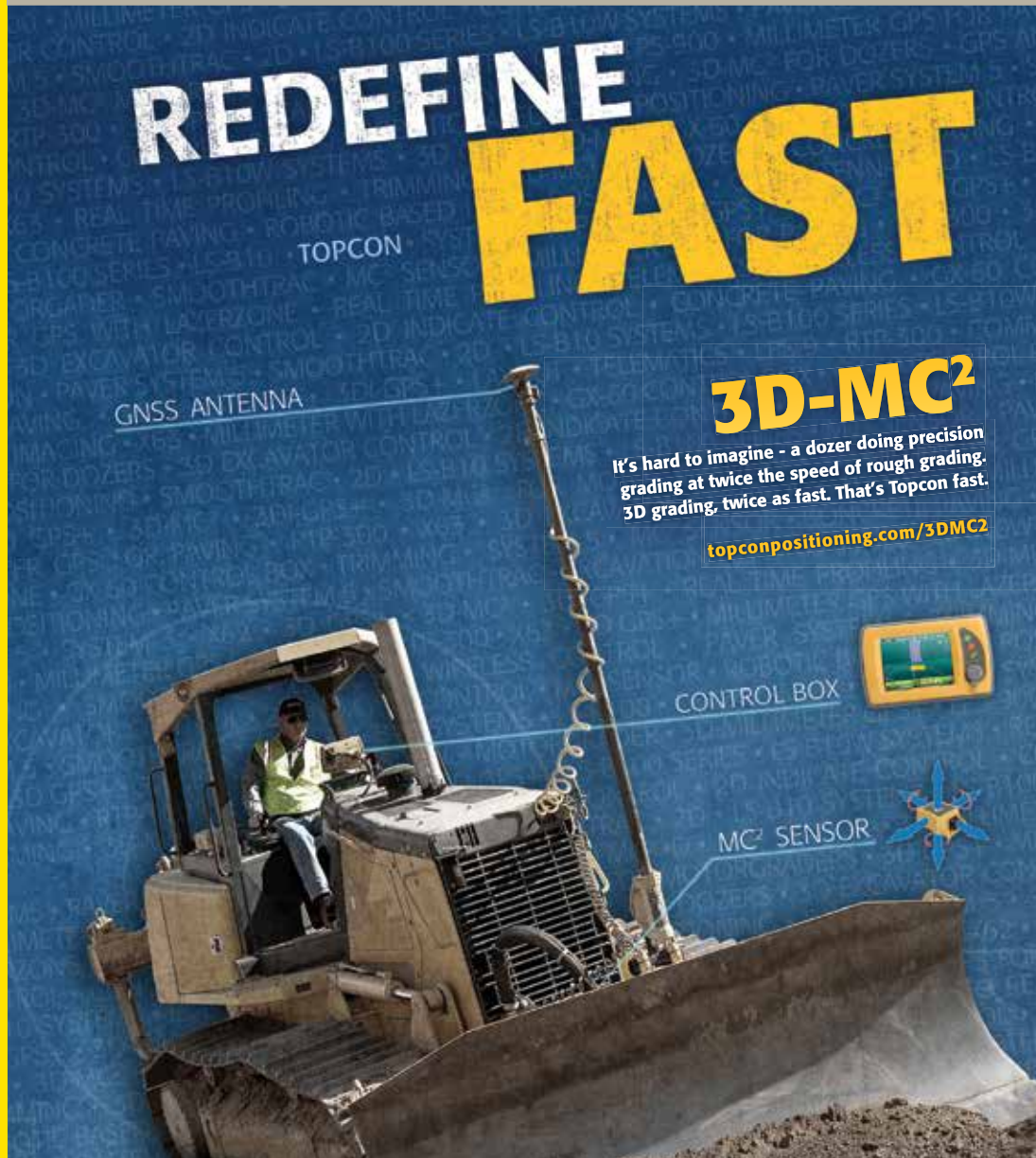
MILLIMETER
GPS

High-precision
fine-grading
for your existing
Topcon
3D-GPS system

www.topconpositioning.com

JC Equipment Sales & Leasing

2300 East Kemper Road • Cincinnati, OH 45241
877-529-7626 • 513-772-7612



**REDEFINE
FAST**

TOPCON

GNSS ANTENNA

3D-MC²

It's hard to imagine - a dozer doing precision grading at twice the speed of rough grading. 3D grading, twice as fast. That's Topcon fast.

topconpositioning.com/3DMC2

CONTROL BOX

MC² SENSOR



SALES • SERVICE • SUPPORT

WE PURSUE A COMMON
GOAL:
THE PERFECT ROAD.



Close to
our customers



Whether new construction or rehabilitation – roads are our customers' domain. With future-oriented technologies, reliable machinery, unceasing innovation, and highest demands on customer service and advice, we pursue one single goal: The perfect road!

ROAD AND MINERAL TECHNOLOGIES

www.wirtgenamerica.com



Hudson, OH 330.655.5900 • Columbus, OH 614.475.2880
West Chester, OH 513.777.5556 • www.themcleancompany.com