

# OHIO ASPHALT

*THE JOURNAL OF OHIO'S ASPHALT PROFESSIONALS*

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# OHIO ASPHALT

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

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## THE PRESIDENT'S PAGE



**CLIFFORD URSICH, P.E.**  
PRESIDENT & EXECUTIVE DIRECTOR

**“As I have examined in my 30 years of a growing fondness and love for the asphalt industry, I believe the relationships made is a consideration in the love of asphalt. I am struck how even the fiercest of competitors show deference and concern for one another. No greater example of such is observed when a crew suffers a fatality, or serious injury – the entire industry takes a pause, shows support and offers a helping hand. And when there are major accomplishments, all celebrate the others’ successes.”**

# I ASPHALT

It's an interesting thing how a business gets into your blood. In my early days at FPO I often heard contractors talk about their love for “the business,” referring to asphalt contracting. They would say: “It's in my blood.” I attempted to picture that in my mind's eye – black, sticky and hot asphalt liquid coursing through the veins. That's not all that appealing of a thought. With all the adversity and grind that is encountered in a day's paving, a person has to wonder why there is this “love” for the business. It's been 30 years for me to be alongside these guys and gals and I'm thinking maybe just maybe, I've figured it out.

If you haven't walked a paving job, felt the heat radiating from the paver, smelled that most peculiar asphalt aroma, experienced the earth shaking from a vibratory roller, or accompanying a technician as he stoops to obtain a sample from a centerline joint as vehicles rush by, then it may be difficult to appreciate how strong the love of the business must be for an asphalt guy or gal to exclaim, “It's in my blood.”

Where many in this day and age want for meaningful work, those in this line of business go home tired and dirty – but satisfied. They look over their shoulder at day's end to see the results of their effort – a pavement black as can be and velvet smooth, an accomplishment that provides a meaningful public service.

But, the asphalt industry comprises more than the talented people who pave; there is a massive infrastructure that supports the process: mix production, procurement of materials and equipment, THE SHOP, accounting, EH&S, QA and a myriad of others who do their job (with excellence!) to make paving a smooth spread possible. From laborer to owner and every position in between, each play a role in attaining the final product. If you were to title such an

eclectic group, you might as well call it TEAM ASPHALT.

So, why do they do it? Why do they love the business, laboring diligently and with such tenacity?

All do it for the paycheck for sure, but there is much more to it than good wages. There is the exhilaration when the TEAM gets the winning bid, the satisfaction when the TEAM's metal reaches higher achievements, and the recognition that comes to the TEAM for a quality job well done. However, I do believe the reason for their love has another dimension.

As I have examined in my 30 years of a growing fondness and love for the asphalt industry, I believe the relationships made is a consideration in the love of asphalt. I am struck how even the fiercest of competitors show deference and concern for one another. No greater example of such is observed when a crew suffers a fatality, or serious injury – the entire industry takes a pause, shows support and offers a helping hand. And when there are major accomplishments, all celebrate the others' successes.

Having distilled the matter as far as I can understand, to “Love Asphalt” hasn't anything to do with hot asphalt liquid coursing through a person's veins. To Love Asphalt is to love and CELEBRATE ACHIEVEMENT and the RELATIONSHIPS FORGED.

Having served the membership of Flexible Pavements for 30 years, 13 of those as your executive director, I have much to celebrate and many relationships forged. It has been a wonderful privilege to work for an industry that cherishes quality construction, honest





and vigorous competition, providing a public service and customer satisfaction. The FPO membership can be proud of their board of directors for firmly holding to these tenants; “keeping their commitments even when it hurts.” Psalm 15:3

**“For everything there is a season, and a time for every matter under Heaven.”**

**Ecclesiastes 1**

That Scripture informs me it is time to say goodbye.

A multitude of relationships can be forged over 30 years; at least that has been my experience. Like a band of brothers, adversity forges strong bonds. I will forever appreciate having worked alongside the many of you in this association, celebrating your achievements and our encouraging one another during the challenging times.

I thank the FPO Board of Directors for allowing me the opportunity to serve as your executive director. Your leadership and generosity have been sound and gracious.

I can attest the FPO staff – Flo Flowers, Bill Fair, Andrew Gall, Jim Marszal and John Crane – is a dedicated bunch, believing wholeheartedly in FPO’s mission. Thank you for your diligence.

I thank my predecessor Fred Frecker for having broad shoulders upon which I stood.

Thank you to the many friends at ODOT with whom we endeavored together for “the highest quality in asphalt production – that’s you folks at the Test Lab, Pavement Engineering, Construction Management and District friends.

Oh so many others in the consulting industry, local governments and academia I say thank you for your partnerships.

Most sincerely I thank my “Sweetheart” Mary Ann, my wife, encourager and sounding board; our children; and my Counselor – The Lord Jesus Christ.



I will end with this proclamation . . . I WILL ALWAYS LOVE ASPHALT!

*Clifford Ulrich*







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# Mixture Highlight -

Darke 404-LV,  
As Per Plan



**MIXTURE PROPORTIONS**

SIEVE	TOTAL PERCENT PASS
1/2 INCH	90 TO 100
3/8 INCH	72
NO. 4	42 TO 60
NO. 8	27 TO 45
NO. 16	10 TO 22
NO. 30	0 TO 8
NO. 200	0 TO 5

GRAVEL COARSE AGGREGATE: 6.5%  
LIMESTONE COARSE AGGREGATE: 6.9%  
LIMESTONE COARSE AGGREGATE: 6.9%  
BLENDS: 6.7%  
SLAG AGGREGATE BLENDS: AS  
DETERMINED BY MARSHALL MIX  
DESIGN PROCESS: MEDIUM TRAFFIC  
BINDER CONTENT SELECTION AT 2.5%  
AIR VOIDS

NOTE 1: INCREASE BINDER CONTENT  
0.2% FOR COARSE AGGREGATE HAVING  
ABSORPTION > 4.0  
NOTE 2: THE ENGINEER MAY ADJUST  
BINDER CONTENT. COMPENSATION  
WILL BE MADE ACCORDING TO  
404LV122

GRAVEL COARSE AGGREGATE: 5.6  
LIMESTONE COARSE AGGREGATE: 5.8  
2500 MAX. PG64-22

PG5B-28 20 MAX. PG64-22 10 MAX.

**VIRGIN BINDER MIX**  
(% BY WEIGHT OF MIX)  
TRAFFIC VOLUMES (ADT)  
BINDER GRADES:  
LIMITS FOR RECLAIMED ASPHALT  
PAVEMENT (% BY WEIGHT OF MIX)

**ITEM 404-LV AS PER PLAN, SPEC**

ALL REQUIREMENTS OF ITEMS 404, 405, 406 AND  
448 APPLY FOR QUALITY CONTROL AND  
ACCEPTANCE ON THIS PROJECT. THESE  
FUNCTIONS REQUIRED BY THE DEPARTMENT  
IN ITEM 404, SHALL BE PERFORMED BY AN  
INDEPENDENT CONSULTANT RETAINED BY  
DAWKE COUNTY

MIX DESIGN: DETERMINED A 100 MIX FORMULA  
(LHV) BY COMBING LIMESTONE COARSE  
AGGREGATE, FINE  
AGGREGATE, RECLAIMED ASPHALT PAVEMENT  
TRAP  
AND ASPHALT BINDER IN PROPORTIONS THAT  
RESULT  
IN AN ASPHALT MIXTURE MEETING THE  
8.0% LIMITS  
IN TABLE 3 USING VIRGIN PG5B-28 OR NO  
LIVE GRAVEL  
COARSE AGGREGATE

NOTE: A MINIMUM OF 50% OF THE VIRGIN  
FINE AGGREGATE MUST BE NATURAL SAND  
75/100





**Co-developed by Valley Asphalt Corp., A Jurgensen Company and Darke County Engineer's Office, Darke 404-LV is a thin-lift mixture designed for low-volume roads. Darke County Engineer Jim Surber expressed that the county is "very satisfied" with the mixture's performance so much so that they have placed more than 100 miles of the mixture since its inception in 2016. Seeing the success of this mixture, local cities, like Greenville, and other area towns have begun utilizing it as well.**

Darke 404-LV, is a rendition of the ODOT 404 specification of yesteryear. However, Darke 404-LV is specifically designed for low-volume roads with flexibility and longevity in mind. The biggest concern for low-volume roads is typically environmental damage due to oxidation and embrittlement of the asphalt binder. Darke 404-LV is designed with a fine gradation and a lower air void content to combat this of 2.5% instead of the standard 3.5 or 4.0%. Reducing the air void content allows for higher asphalt binder contents than those observed in traditional asphalt surface course mixtures.

This additional asphalt increases the film thickness on the aggregate, which helps delay the effects of oxidation of the asphalt binder. Darke 404-LV also specifies the use of a softer binder grade, PG58-28, which also helps combat surface cracking that occurs from long-term aging. The increase in binder, along with the fine-graded structure, allows the 404-LV to be near impermeable to air and water, which is key to achieving long pavement life and life-extending capability. In addition, these two factors help promote a smooth riding surface and allow for easier compaction of the pavement — which increases density.

Of the projects observed, none had any kind of wide-scale distress — and even those reviewed from 2016 only had minor cracking. The texture of the mat on all the projects was very consistent with an exceptionally smooth surface. The typical application used by Darke County is ½ inch of scratch with a 1-inch 404-LV overlay.

For more information about the application and development of Darke County's 404-LV specification, be sure to tune in to the Ohio Asphalt Paving Conference, February 3-4, 2021.



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# HiMA Performs Very Well in High-Stress Applications



**High-stress locations present challenging conditions for asphalt concrete. Fortunately, performance expectations can still be achieved provided proper design standards and materials are utilized.**

Ohio's PG 70-22M and PG 76-22M polymer-modified binders continue to perform well in most typical heavy-traffic environments. However, the high volume, heavy loads and high tire pressures of today's trucks still present challenges for pavement engineers in some high-stress areas or other unique locations.

To address the most troublesome areas, a relatively new binder/concept is available particularly for engineers utilizing "grade bumping" to address high-stress locations. And, this alternative simply involves an "as per plan" plan note using standard Item 442 Superpave specifications.

Over the last several years, several ODOT districts have specified Item 442 Superpave asphalt concrete using Highly Modified Asphalt, aka HiMA, to address their chronic high-stress locations. HiMA is an asphalt concrete mix modified with Kraton™ D0243, a styrene butadiene styrene (SBS) modifier. In 2006, Kraton Polymers introduced the HiMA concept where asphalt was modified with substantially higher doses of SBS polymer compared to conventional polymer mixes. Kraton Polymers developed D0243 SBS polymer using self-crosslinking chemistry to increase polymer loading and improve

performance without compromising compatibility (with a range of binders) or workability during placement.

In terms of ODOT specifications (702.01) and PG grade, common (SBS) polymer-modified binders such as PG 70-22M and PG 76-22M typically contain 2-4% +/- SBS. A HiMA binder is classified as a PG 88-22M binder and contains 7-8% +/- SBS polymer. The significant increase in SBS effectively changes the binder from a rubber-modified asphalt to an asphalt-modified rubber. As a result, substantial improvements occur to the physical properties of the binder, including increased softening point and improved mixture-fatigue resistance. This equates to performance benefits related to cracking and rut resistance as well as increased strength and durability.

Based upon research and the aforementioned benefits, utilizing HiMA/PG 88-22M binders appears to be a viable solution for high-stress and other critical pavements. Additional benefits related to initial construction cost and lifecycle cost savings are also possible.

## **Ohio's Experience with HiMA**

Ohio's first experience with HiMA/PG 88-22M binder occurred on Project 13-0598, in ODOT D-2. This project paved the intersection of U.S. Route 6 and U.S. 23 in Wood/Sandusky counties to address a long-standing rutting problem at a signalized intersection. This project consisted of a 4-inch inlay using Item 442 intermediate and surface courses both specified with a PG 88-22M binder. Recent rut measurements on this seven-year-old pavement were all less than or equal to 1/8 inch – with most measurements at 1/16 inch or 0 inches.





**US-6/US-23 Intersection ODOT D-2**

Since 2013, ODOT has specified HiMA/PG 88-22M on 11 projects. Depending upon project characteristics, HiMA can be specified for 1) surface course, 2) surface and intermediate course and 3) full-depth (base, intermediate, surface) applications. Typical projects have addressed intersections, ramps and roadway sections typically subject to heavy trucks. All 11 ODOT projects are performing well with regard to rutting, shoving and cracking. Several additional projects are featured below.



**Lancaster Bypass (US-33), ODOT D-5**

In 2017, ODOT District 5 specified HiMA/PG 88-22M for the Lancaster Bypass (US-33), Projects 17-0206 and 17-0385. Project 17-0206 utilized HiMA in a 12.5mm surface course. Project 17-0385 utilized HiMA in a 19mm and 12.5mm two-course treatment. Recent rut measurements on this three-year-old pavement indicated ruts at 0 inches with no observed cracking.



**I-70WB exit to Wilson Road**

Ohio's most unique HiMA/PG 88-22M project occurred as part of Project 18-0597. Constructed in 2019, FPO coordinated with ODOT D-6 and OPE to place full-depth HiMA (302, Intermediate, surface) at the top of the I-70WB exit ramp to Wilson Road in Columbus. This location is a demonstration project intended to evaluate the viability of full-depth HiMA pavement in a location subject to very high truck volume and a stop condition. Recent rut measurements at this more than one-year-old section were all less than or equal to 1/8 inch – with most measurements at 1/16 inch or 0 inches.



**SR-110 Roundabout in Napoleon**

Honorable mention for most unique HiMA/PG 88-22M project goes to the brand-new SR-110 roundabout in Napoleon (ODOT D-2). Although HiMA is typically produced and placed at slightly higher temperatures than standard polymer binders, this project demonstrates that Highly Modified Superpave mixes (intermediate and surface) can be placed on unique projects with no unusual workability issues. Of course, a quality paving crew from Gerken Paving Inc. helps.

The performance of HiMA over the last seven years has been very encouraging. If your pavement is considered a high-stress location, a high-priority project or if you're simply looking for the highest-quality materials to ensure performance on a high-profile roadway, consider a mix with a HiMA/PG 88-22M binder. Based largely upon the performance of the ODOT projects constructed to date, combined with available research, we're optimistic that we will be seeing greater use of **HiMA – Highly Modified Asphalt** – in the foreseeable future.

**Editor's Note:** For bridge deck overlays using HiMA/PG 88-22M ... See ODOT SS-856 – Bridge Deck Waterproofing Asphalt Surface Course.





## Testing & Statistics, Part I

# Probability's Pizza Parlor – Representative Sampling

Welcome to Probability's Pizza Parlor at the crossroads of uncertainty and variability, where we talk about pizza and everyone's favorite subject . . . statistics. While it may have been a sour subject for some in school, statistics is an incredibly important tool for a good quality-control program; although it can be challenging to navigate at times. The goal of this series is to address some common statistical means and methods and shed some light on how they work. There is a little twist, however, as even though this is an asphalt magazine the discussion will involve mainly

pizza since I like pizza; it plays well when discussing statistics and it needs less description than asphalt production.

To conduct any statistical analysis one first needs to gather information on its subject. Thus we begin with sampling, which is potentially the most important part of any statistical analysis. Regardless of how extensive an analysis might be, it would be meaningless if its sample information was carelessly gathered. Successful analyses require the samples to reflect the population, with the ultimate goal being equal properties between the samples and the population. In this article we are going to look at three topics regarding sampling: sample size, selection and distribution.

Population sampling ranges in complexity. However, given the right circumstances it can be quite simple. For instance, imagine you are ordering pizza for a small population – like your family. How would you decide what to order?





To guarantee your sample data is equivalent to the population, you could ask all your family members what they want. By doing this your sample is the population, thus fulfilling the equality goal of sampling perfectly. A secondary option may be to ask your better half, if they are like my wife, they would know what everyone likes, which would also fulfill the sampling goal – though, through representative sampling. In this case, your better half's opinion would be representative of your family's. It is important to note that a representative sample may not always be completely equal to the population. Finally, you could order just what you wanted, however, this is unlikely to be reflective of the population – especially if you like anchovies. This would be an example of a bias sample. In this scenario, since the population is small, asking everyone is relatively simple and provides the most accurate outcome. However it changes when the population increases, which makes representative samples more appealing.

Increasing the complexity, imagine that the boss has asked you to set up a pizza party for your 300 coworkers to celebrate George's retirement. George was a popular guy. How would you discern what to order, barring any digital polling/emailing? You could use the same methodology that worked for your family, either ask everyone or ask your work spouse, however, now both cases pose problems which might ruin George's party. On one hand, you certainly could ask all 300 coworkers. Similarly with your family, this would give an absolute depiction of what is needed – although now at the expense of time, which will upset your boss. On the other hand, you ask your work spouse who knows the office well, but can you ensure that they can represent the entire population? Three hundred people is a lot to be represented by one person, and God forbid if she likes anchovies too. So, to avoid losing your job or giving George a fishy party, what do you do? Since 300 samples is too much and a single is too little, you need to establish a reasonable number of samples/people that will show a good correlation to the populations while remaining economical.

Establishing a sample size can be simplified to how confident you want to be that your samples represent the population. The higher level of confidence that the correct pizzas will be ordered means more people should be sampled. Conversely, the more representative you believe your coworkers are towards the population the less people you need to ask.

Once you determine the sample size, you are now faced with hurdle number two: How to make your selection?

Two rules to consider when selecting our samples: first your selections must be random, and secondly the selection must remain unbiased. These two rules ensure every coworker has equal opportunity/probability of being asked and there is no skew or predetermination in the selection. In this case, and many others, pure random selection works well. However, in certain cases, like asphalt sampling, it is desired to have the samples distributed evenly throughout a population. Having even distributions ensure we do not have large quantities of material unrepresented on a project. Regarding George's party, imagine your purely random selection chose only people from accounting (this may result in a rather plain pizza party). While unlikely, clustering like this is possible and to combat it the population can be stratified. This takes a large population, i.e. a project or company, and breaks it into smaller subpopulations from which to sample. In the case of the office, you can stratify a company into departments. Then to assign the

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samples you will then need to decide whether to give equal representation by group or weighted representation by group. By this, I mean assigning a number of samples by the population of the group or evenly regardless of the group's size. Equal group sizing is typical in construction, but let's say if IT has 150 workers by itself, should it get half of the selections or should it get the same number of samples as HR with 30 workers? Then using random numbers, you can select the people to be selected within each group. Using stratification, you can remove the chance of having a clustered group of samples that can bias the results and inaccurately represent the population.

Let us ensure George gets a great party by first making sure you represent all your coworkers' opinions by ensuring an ample sample size. This small group of coworkers is meant to be your representative sample group, and their opinion will represent their fellow coworkers' pizza choices. If you are less confident in how representative your coworkers are, then increase the number sampled to get a more confident collective opinion. However, remember not to go too big and make it too time consuming. To help prevent any potential sample clustering, you can subdivide your office into smaller populations to ensure a more uniform distribution. Then, coworkers should be chosen from their groups using random numbers. Also, don't forget to ask George what pizza he wants . . . It is his retirement party after all.

**O A**



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# THE BRIGHTEST IDEAS ARE IN ASPHALT



Visionary engineers and researchers are constantly innovating asphalt pavements to meet the needs of the future. They've created game-changing products like warm-mix asphalt and Thinlays for pavement preservation — and they're not done yet. The industry is already working on asphalt roads built to accommodate the safe use of driverless vehicles. This commitment to innovation is paving the way for even longer-lasting, higher-performing pavements.

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# Legal New Year's Resolutions for 2021

By Don Gregory, Esq., Kegler Brown Hill + Ritter Co.

Most of us are only too eager to see 2020 come to an end, even if it has been a pretty good economic year for the construction industry. Here are some 2021 New Year's Resolutions to help you start the year off right.

**1. Talk to your bonding agent about removing any personal liability from your General Indemnity Agreement (GIA)**

Many contractors who have been the beneficiary of PPP funds, and a solid year of profits, are showing their best financial statements in a while. If you have not already removed yourself personally from the GIA with your

bonding company, this may be an ideal time to make the pitch to your surety to do so. Liability on performance bonds can go on for almost a decade and this is a good risk to avoid personally.

**2. Talk to your insurance agent about coverage for construction defects**

For many years contractors and subcontractors have assumed that construction defects would be covered by their traditional Commercial General Liability (CGL) policy. But, recent decisions in Ohio have jeopardized any real coverage for construction defects under a normal



GGL policy. Therefore, it makes good sense to review this risk with your insurance consultant and see what special endorsements or other insurance products are available to address this risk.

### 3. Review your lien law procedures and forms

A bumpy economy presents greater collection risks. This is a great time for subs and suppliers to make sure they are instituting proper procedures for serving a notice of furnishing on all meaningful projects before commencing work. Similarly, owners and contractors should ensure that they are instituting proper procedures for ensuring that lien waivers are being received as part of the payment process. And both sides should look at their lien waiver forms to make sure they are broad enough – but not overly broad – to release lien and bond rights through the payment received.

### 4. Reach out to service providers and customers to say "thanks"

As COVID-19 has isolated us socially and much interaction has shifted online, it is easy to become removed from valued customers and trusted service providers. Yet business success remains tied to these relationships.

Find a creative way to stay in touch and show appreciation. Your efforts to reach out in a time of isolation will be noted, and likely rewarded.

### 5. Explore possible exit strategies

Unlike some other businesses, construction companies are not always easy to sell. But there are viable vehicles for doing so, including ESOPs, transfers to family members or key employees, buy-sell agreements, liquidations or sales to a competitor.

Even if a retirement or exit from the business is not imminent, it is not too early to begin planning for future transitions. And trusted advisors are the key to success.

### 6. Review your contracts and consider arbitration instead of litigation

COVID-19-related delays have made the wheels of justice grind slower than ever. Getting a civil trial at many courthouses will occur no

time soon. So you may want to insert mandatory arbitration in your contracts or purchase orders – as arbitration will result in a hearing date much sooner.



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# Jim Walls

## In Memory of Jim Walls, Co-founder of Walls Asphalt



Flexible Pavements pays tribute to Jim Walls, a “Father” of this association.

Jim died on September 24th, having built a rich legacy of service for fellow FPO members to follow.

Walls Brothers Asphalt Co. was voted into the Flexible Pavements Inc.

membership on March 21, 1966. James “Jim” Walls, co-founder with his brother, Roger, serviced the Darke County community providing quality asphalt mix. The company continues to do so as a subsidiary of the Jurgensen Companies.

Jim was appointed as a director of the association in 1974 and continued this leadership position through 1993. The FPO membership elevated Jim to become chairman of the board in 1976, a crucial year for the association. A transition in executive directors was needed to secure asphalt as a heavy-highway material for use by the Ohio Department of Transportation. Jim’s hand guided the process and secured a beloved industry

advocate in William “Bill” Baker, former ODOT assistant director, who accomplished that end. An enduring friendship was forged.

Jim did it again in 1992 – his last year as a director – when the board hired Montgomery County Engineer Fred Frecker PE, PS., who led the association to its highest accomplishment – securing a 95% asphalt dominance as pavement surface type.

And as if that weren’t enough, Jim also served on the Legislative Committee and as chairman of the Membership & Finance Committee.

Humble in all his doings, Jim’s legacy is one of quiet service and exceptional outcomes – a legacy worthy of following.

To Carol, Perry, Roger and other members of the Walls Family, the Flexible Pavements of Ohio membership mourns your loss and expresses its gratitude for Jim’s life lived. May he rest well in the loving arms of God his Creator.

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## Ohio Asphalt Paving Conference – Virtual Event February 3-4, 2021

The Ohio Asphalt Paving Conference is a collaborative effort of state and local government, academia and the asphalt industry to present practical, usable technologies and strategies for the design and construction of asphalt pavements.

Visit FPO's website at [www.flexiblepavements.org](http://www.flexiblepavements.org) for more information regarding this event.

## Thank You

*(Editor's note: Alex Tremper is a recipient of a 2020-2021 FPO Asphalt Pavement Industry Scholarship.)*

Dear Cliff Ursich:

Thank you for choosing me as a recipient for the Flexible Pavements of Ohio Scholarship. I was very happy and appreciative to learn that I was selected.

I am a construction management major at Bowling Green State University. I plan to pursue a career as a project manager in the commercial construction industry. I am currently a senior and plan to graduate in the spring of 2021. Thanks to you, I am one step closer to that goal.

I am very dedicated to my academics and continue to maintain a 4.0 GPA. I feel that my Co-Op experience has been very beneficial and has helped me excel in my studies. My previous Co-Ops have also helped to further develop my skills and knowledge in the commercial construction industry.

By awarding me the Flexible Pavements of Ohio Scholarship you have lightened my financial burden, which allows me to focus more on the most important aspect of school, learning. Your generosity has inspired me to help others and give back to the community. I hope one day I will be able to help students achieve their goals just as you have helped me.

Sincerely,

Alex Tremper  
Bowling Green State University







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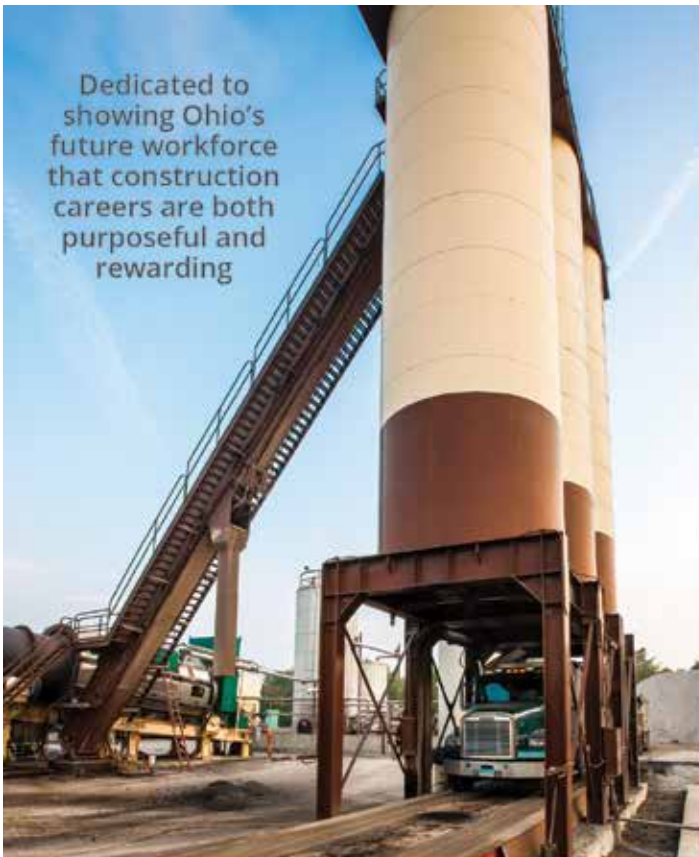
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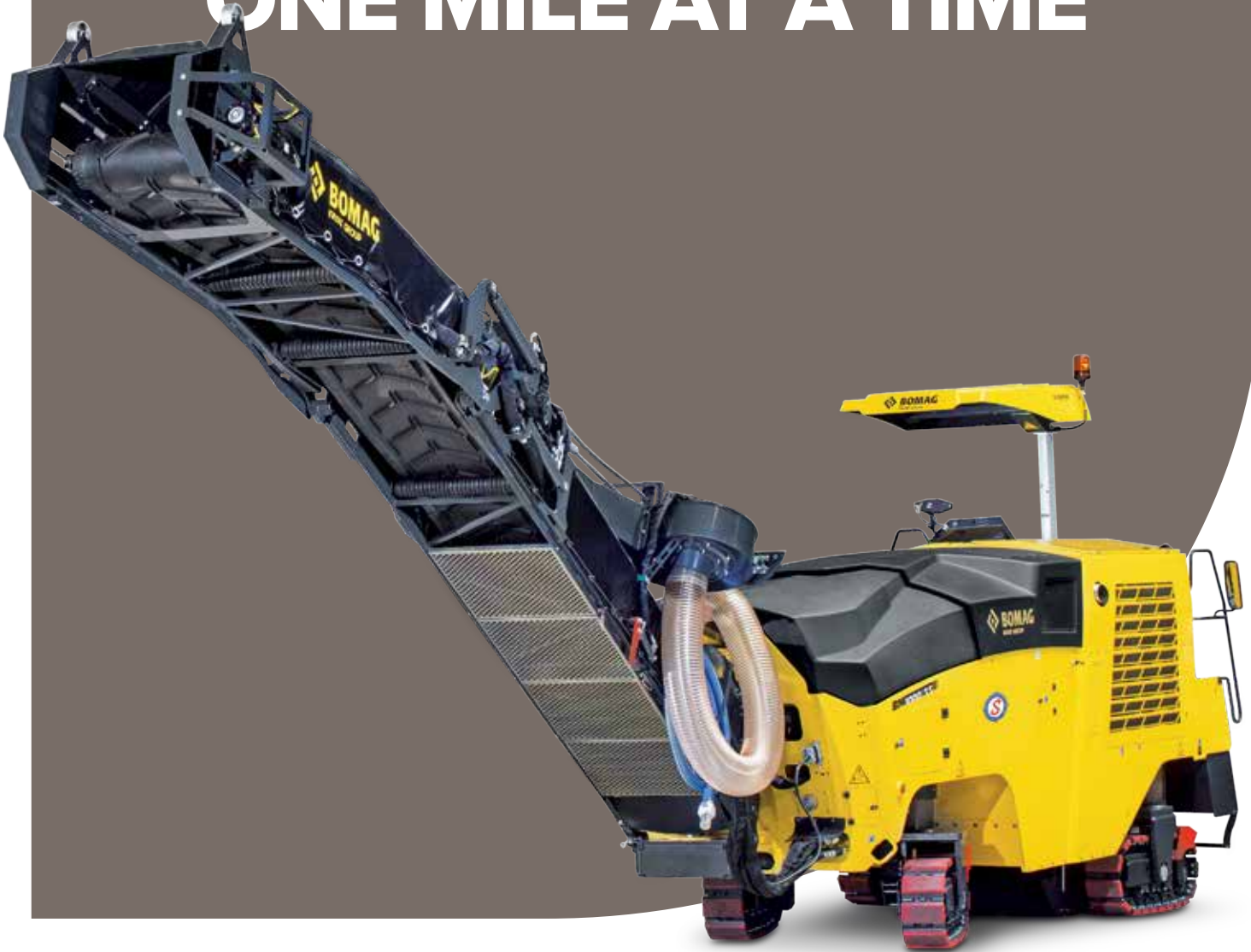
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