

SPECIAL ANNOUNCEMENT

Voting Open for the 2023 Readers' Choice Awards

Dear JPCL Readers,

Happy 2024! With this new year comes another chance for the JPCL audience to look back on the past year of engaging JPCL content and commemorate some of our most prolific contributors.

This first issue of the year marks the opening of the 2023 JPCL Readers' Choice Awards, voted on annually and presented to the authors of the best articles from the past year. We encourage all of our readers to vote for their favorite articles across a number of subjects.

Eligible articles for this year's awards were published in JPCL between January 2023 and December 2023 and have been classified into four categories:

- Coatings and Materials;
- Process Technology;
- Standards and Best Practices; and
- Projects and Performance.

The following is a list of the eligible articles in each category. For further glimpses into this year's Readers' Choice field, including article summaries and more, check your email for ongoing coverage of the awards in *PaintSquare Daily News*.

Voting will continue through the rest of this month and February and will officially close at midnight, ET, on Friday, March 1. Winners will be announced in the March issue of JPCL.

Visit surveymonkey.com/r/2023jpclawards to cast your ballot!

COATINGS AND MATERIALS

"Large-Diameter Pipe Relining Cost Prediction," by Bobbi Jo Merten, Matthew Elmer and Mustapha Alhassan, U.S. Bureau of Reclamation Technical Center; and Todd Gaston, WestWater Research
JPCL March 2023

"Examining a New, U.S.-Made Abrasive,"
by Jonathan Bernard, Harsco Environmental
JPCL March 2023

"Understanding and Monitoring Photodegradation of Coatings,"
by Rob Francis (Retired) and Daniel McKeown, Dulux Australia
JPCL May 2023

"Anti-Corrosion Protection for Field Joint Coatings in Offshore and Onshore Pipelines," by Ricardo Filipe
JPCL September 2023

"Selecting Protective Coatings for Wind Turbines at Sea,"
by James Lawson, Carboline Company
JPCL October 2023

PROCESS TECHNOLOGY

"Snatched from the Fire: Probing Issues with Application, Inspection and Technology Aspects of Passive Fire Protection,"
by Mike O'Donoghue, Vijay Datta and Robin Wade, AkzoNobel
JPCL February 2023

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JPCL

JOURNAL OF PROTECTIVE COATINGS & LININGS

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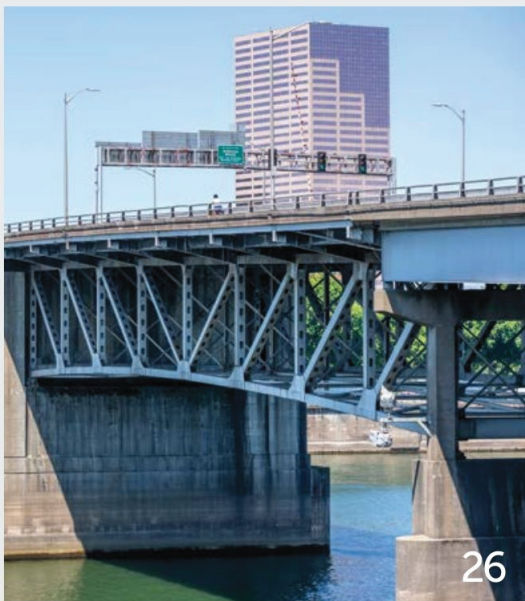
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Photo: Courtesy of Sauereisen



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18 Wet-Blasting Equipment: A Comparison for Industrial Coatings Contractors

BY JON KENIMER, BLASTONE INTERNATIONAL

Wet blasting, the process of introducing water to a mixture of pressurized air and abrasive, is now a mainstream process in the surface preparation field. While the "why"s and "what"s of the process are generally well understood, less clear is the "how" of wet blasting. This article will examine and compare the various technologies and equipment currently available for these applications in the industrial coatings market.

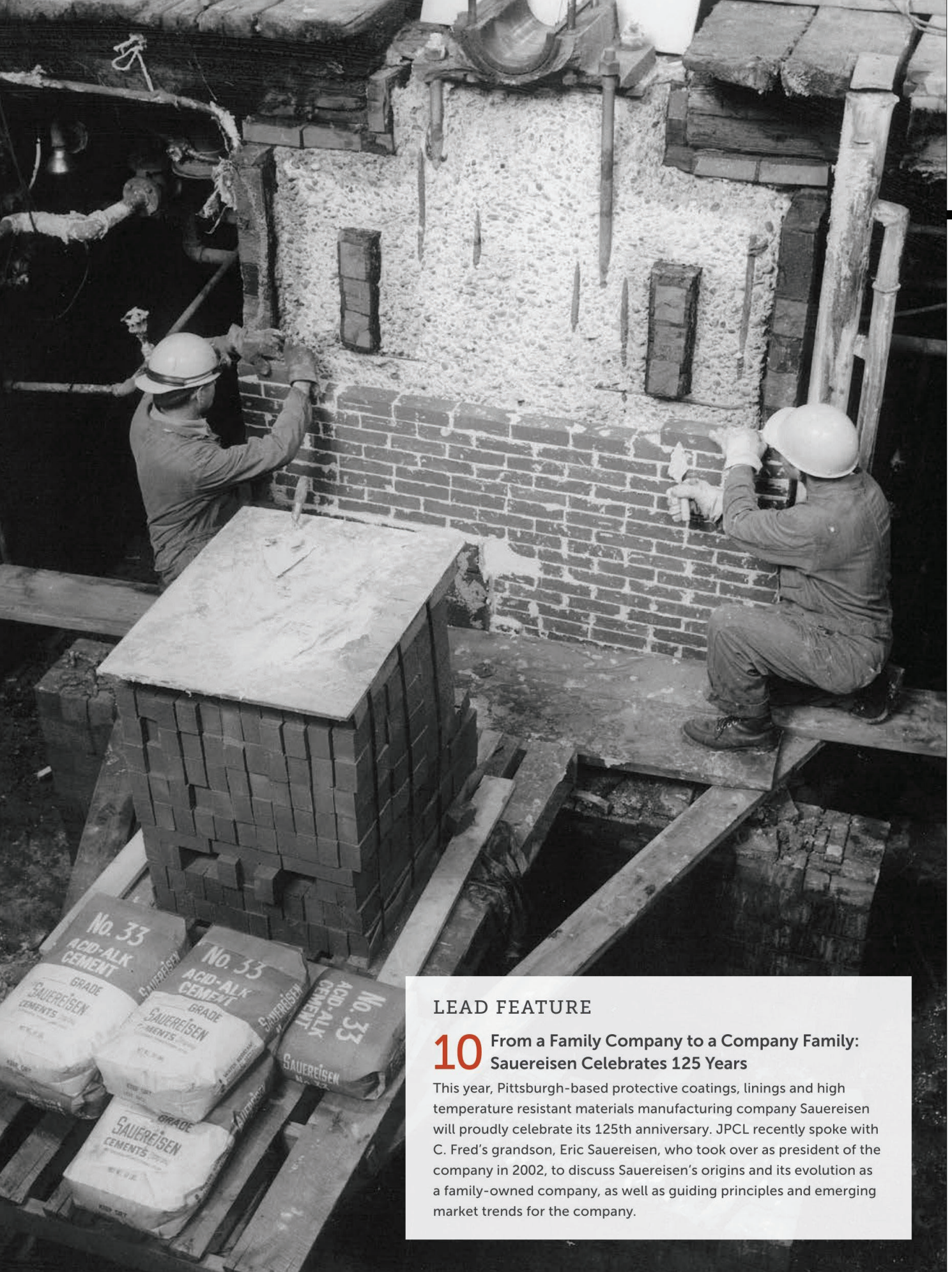
26 Repainting the Morrison Bridge

BY JPCL STAFF

Last summer, crews on the Morrison Bridge in Multnomah County, Oregon, finished a two-year-long repainting project, which included around 2,000 gallons of paint and roughly 5,000 hours of work. This article recaps the completed project, which marks the first time the bridge has been painted since its construction 66 years ago.

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LEAD FEATURE

10 From a Family Company to a Company Family: Sauereisen Celebrates 125 Years

This year, Pittsburgh-based protective coatings, linings and high temperature resistant materials manufacturing company Sauereisen will proudly celebrate its 125th anniversary. JPCL recently spoke with C. Fred's grandson, Eric Sauereisen, who took over as president of the company in 2002, to discuss Sauereisen's origins and its evolution as a family-owned company, as well as guiding principles and emerging market trends for the company.

KTA-Tator Announces 75th Anniversary

Coatings inspection and consulting firm KTA-Tator, Inc., announced early this month that 2024 marks the company's 75th anniversary of providing services to the protective coatings industry.

Starting from what the company calls "humble beginnings" in founder Kenneth Tator's home basement in 1949, KTA currently employs over 170 certified coating inspectors and more than 50 engineers and scientists, providing facility owners, engineers, contractors, fabricators and manufacturers peace of mind that the integrity of steel and concrete structures and other assets are properly assessed and protected.

From its Pittsburgh-area facility, the firm provides worldwide coatings and corrosion engineering and inspection for steel and concrete; field and laboratory coatings failure analysis; environmental, health and safety consulting; and contract administration for maintenance and construction activities. The company also offers instruments sales, service and repair, as well as industry training, education and certification.

Check out upcoming issues of JPCL for more on KTA's rich history in the coatings industry – as well as favorite JPCL writings by KTA employees, published over the years.

CALL FOR RESPONSES: SURFACE PREP SURVEY

KTA-Tator also recently announced that it is seeking input from coatings industry professionals for an online survey that the company says may shape future practices in assessing surface roughness characterization.

According to a press release from KTA, the firm is inviting coatings professionals to participate in this industry survey in an effort to inform the direction of surface preparation. The survey reportedly aims to assess the interest and need in specifying or measuring peak count and peak density parameters and/or angularity of a surface profile, in addition to depth, prior to coating installation. KTA says that insights gleaned from this short survey may play a pivotal role in determining whether the industry considers adopting new practices for assessing surface roughness.

The compiled results of this industry-wide survey will be presented at a special surface preparation meeting/workshop scheduled for March 4, 2024, from 1:00 p.m. to 3:30 p.m. CST in Room 206 of the New Orleans Ernest N. Morial Convention Center. This meeting is part of the AMPP 2024 National Conference + Expo, taking place in New Orleans from March 3 to 7, 2024.

KTA says that this 15-question survey should take about 5 to 10 minutes to complete. The survey is live at forms.gle/WHnktUKuKkq4JDzY7 and will remain open through Feb. 16, 2024. For more information, visit kta.com or contact Brian Ferris, bferris@kta.com, 800-245-6379.



BlastOne, Qlayers Partner for Mobile Coating Robots

Blasting and painting equipment and supplies distributor BlastOne International recently announced that it has entered an exclusive United States distribution partnership with Netherlands-based coatings company Qlayers.

According to the company's release, this partnership is meant to introduce Qlayers' mobile coating robots, designed for remote field projects in the oil and gas industry.

Qlayers specializes in advanced robotic solutions for coating large-scale industrial assets, including storage tanks, wind turbines and ships. The 10Q robots, built by Qlayers, can offer efficiency and safety benefits for industrial coatings users. Before their U.S. introduction, the robots had

already gained international interest, BlastOne says.

Key advantages of these robots, according to the company, include:

- **Efficiency:** The robots are reportedly capable of applying multiple protective coating layers much faster than human teams, accelerating project timelines;
- **Safety:** These robots can significantly mitigate fall risks by reducing human working hours at dangerous heights by up to 85%;
- **Paint Usage:** The robots' automated coating method reduces overspray, potentially resulting in up to 50% paint savings;
- **Application:** Ensuring consistent coating thickness, the robots can deliver precise feathering between rows; and
- **Eco-Friendly Technology:** The patented spray shielding

system significantly reduces the release of volatile organic compounds and microplastics into the greater environment.

"We are excited about our partnership with Qlayers," said Matthew Rowland, CEO of BlastOne. "The 10Q robots are not just innovative; they're transformative for large tank coating projects in the U.S."

Josefien Groot, Co-Founder and CEO of Qlayers, showed her enthusiasm during the grand opening of BlastOne's Houston office, where the partnership agreement was officially signed.

"This partnership signifies a crucial step in our mission to revolutionize the industry," she said. "We're confident that BlastOne's expertise will be instrumental in the widespread adoption of this technology."



Sponge-Jet Appoints New CEO

Recently, global manufacturer of dry, low dust, recyclable abrasive blasting media and related equipment Sponge-Jet (Newington, New Hampshire) announced that Edwin Zaharias has taken on the position of President and Chief Executive Officer.

According to a release from the company, Zaharias has succeeded former president and CEO Michael Merritt, assuming his duties and responsibilities at the time of the announcement.

Zaharias reportedly brings almost 20 years of experience in the surface preparation industry to this position, spending the last 15 years working as a senior sales manager for Sponge-Jet.

In his previous position, Zaharias reportedly managed the expansion of Sponge-Jet in the Midwest and the growth of new markets in the United States, including the development and integration of robotics and automation to the abrasive blasting process.

Under Zaharias' leadership, the company now plans to progress its

growth and expand its product and service offerings.

"It's an honor to lead an organization so committed to worker safety, while remaining on the cutting edge of blasting technology and productivity. Not only does Sponge-Jet offer a best-in-class product, but the people behind Sponge-Jet are some of the finest in the industry," stated Zaharias.

The release states that Zaharias' commitment to innovation is in line with Sponge-Jet's values, making him a strong fit for the organization.

Under Zaharias' guidance, the company states that it is confident in its ability to support the development of innovative and low-dust surface preparation solutions while also focusing on worker safety and environmental protection.

"Ed has been instrumental in pioneering sponge blast methodology in the field to maximize application success and sales growth. His managerial experience and his passion to grow will further our company's endeavor to produce the most innovative products in our industry," said Ted Valoria, VP of North American Sales.

OSHA Switches Hard Hats to Safety Helmets

Last month, the U.S. Department of Labor's Occupational Safety and Health Administration revealed that the agency is replacing traditional hard hats with modern safety helmets to better protect the agency's workers when they are performing inspections on jobsites.

Previously, OSHA published a Safety and Health Information Bulletin in November that detailed key differences between traditional hard hats and more modern safety helmets. This includes the advancements in design, materials and other features that help protect workers' entire heads better.

"In 2020, the Bureau of Labor Statistics reports head injuries accounted for nearly 6% of non-fatal occupational injuries involving days away from work," wrote the department.

"Almost half of those injuries occurred when workers came in contact with an object or equipment while about 20% were caused by slips, trips and falls."



PHOTOS (FROM TOP): COURTESY OF SPONGE-JET; COURTESY OF OSHA

Traditional hard hats reportedly date back to the 1960s and protect the top of a worker's head. However, they have minimal side impact protection and also lack chin straps. Without the straps, hard hats can fall off a worker's head if they slip or trip, leaving them unprotected. They also lack vents and trap heat inside.

Additionally, safety helmets may offer face shields or goggles to protect against projectiles, dust and chemical splashes. Others can offer built-in hearing protection and/or communication systems to enable clear communication in noisy environments.

The agency recommends safety helmets be used by employees:

- Working at construction industry and the oil and gas industry;
- Working in high-temperature, specialized work and low-risk environments;
- Performing tasks involving electrical work and working from heights; and
- When required by regulations or industry standards.



Researchers are developing sensors to monitor and help prevent damage to wear-resistant coatings on planes, bridges, pipelines, turbines and more. Do you believe this type of technology will give coatings a longer lifespan?



MIKE BEITZEL:

"I am not sure how a sensor will help prevent wear damage on bridges. Not sure that a sensor will extend coating life, but [it] may be useful in coating selection or testing to measure wear resistant capacity of various coatings in similar exposures."

IN RESPONSE TO:

"NTSB Releases Fern Hollow Investigation Findings" *(PaintSquare Daily News, Jan. 11)*

New information has been released from the National Transportation Safety Board's investigation into the 2022 Fern Hollow Bridge collapse in Pittsburgh, reportedly revealing failures by the city to properly service the structure and other bridges.

According to reports, these new documents show that the consultant who led multiple inspections of Fern Hollow and other bridges told the city

several times that it needed to keep drains clear of debris.

The new information comes one year after the NTSB released a report which found that a lack of maintenance had led to clogged drains on the bridge, resulting in the corrosion that played a part in the collapse.

After the collapse, the NTSB reportedly broadened its look at bridges across Pennsylvania

and found that the state had numerous bridges in similar states of degradation. The NTSB's latest documents reportedly raised concerns over the Pennsylvania Department of Transportation's bridge inspection procedures.

GREGORY STONER:

"At least some good news came out of this catastrophe. In the future, bridges under Pennsylvania's purview should be better serviced and hopefully inspected."



Tnemec Antifouling Coatings, Penetrating Sealers

Protective coatings manufacturer Tnemec Company, Inc., recently announced the launch of its HullClad line of coatings, which the company says is designed to protect ships' and vessels' hulls in harsh underwater marine environments.

According to an emailed release from the company, the coating system includes Series 190 Epoxy Primer, Series 191 HullClad TC, an epoxy tiecoat and antifouling paints Series 194 and 195 HullClad CU.

"Every boat owner knows the issues marine fouling can cause to their vessel," said Andy Margarit, the Marine Market Director at Tnemec. "If it's not properly addressed, layers of slime, barnacles, and marine growth can increase fuel consumption, affect top speed, or make the boat harder to maneuver."

Tnemec explains that Series 191 HullClad TC is a tie-coat, designed to give extended recoat windows for the shipyard or applicator to overcoat with an approved antifoul coating. Series 191 can reportedly give contractors up to five days to apply an approved antifouling topcoat to help with application to the entire bottom paint system.

Additionally, Series 194 and 195 HullClad antifouling paints act as self-polishing coatings. This reportedly means that as a vessel travels through the water, a new layer of biocide within the coating gets exposed and keeps the bottom paint performing effectively and protecting the substrate.

Other features from the HullClad line of coatings reportedly include a service life of up to 60 months, low-VOC and high-volume solids, brush, roll or spray applications, as well as reapplication with little surface preparation.

Additionally, Tnemec also recently released its newest epoxy penetrating sealers, Series 108 and Series 109 ProBond. According to the company's emailed release, the new sealers were designed to adhere to a number of substrates, including old finishes, and can be used as an overcoating primer.

Series 108 and 109 are reportedly low-penetration epoxy sealers that can offer extended pot life and recoat windows, low-temperature cure, and shipping and packaging advantages. The solvent-free coatings can reportedly be applied at a low film thickness to reduce stress and weight on old tightly adhered coatings, helping create a strong foundation for high-performance epoxy and polyurethane finishes.

Hempel Coating Estimation Software

Global coatings company Hempel recently launched a new coating software designed for intuitive coating estimations on steel sections. The Hempel Engineering and Estimation Technology (HEET) Dynamic software reportedly offers faster, easier and more accurate calculations for structural engineers and estimators. The company explains that the software offers up to 10 times faster calculations, without consulting third party engineering services or passive fire protection coating providers.

Hempel adds that HEET Dynamic is up to date with latest industry standards. It utilizes built-in calculators for automated thickness and volume calculations, including a copy and paste functionality to give the user full control. Additionally, HEET Dynamic includes section factor calculations, default limiting temperatures, cellular beam calculations, a customizable user interface and project dashboard with a libraries feature.

According to the company's release, the system at a glance include the following features:

- 100% estimation accuracy;
- Up to 10 times faster calculations;
- Minimizes the risk of coating failure;
- BIM plug-in tool for 3D models and construction details;
- Structural Fire Design upgrade available for advanced users; and
- Easy to download and use.



Seal For Life Concrete Pipeline Coating

International coatings platform Seal for Life Industries has unveiled a new addition to its Powercrete pipeline coatings. According to the company's release, the new DD 410 abrasion resistant overlay (ARO) coating will join the company's lineup of liquid epoxy polymer concrete coatings to protect the pipeline industry.

Powercrete DD 410 is reportedly a new generation solvent-free epoxy ARO polymer concrete coating that provides protection to the FBE coated pipe for directional drilling, thrust (slick) bore and pull-through applications. Powercrete can reportedly be applied directly on the FBE mainline coating of a pipeline to withstand rough terrain conditions.

The company states that DD 410 can also offer:

- 150% faster gel time;
- 60% improved transfer efficiency; and
- Excellent gouge resistance.

"This product has exceptional abrasion, strength, hardness, impact resistance, and adhesion properties, making it the ideal choice for directional drilling projects", said Mario Moreno, Product Specialist for Powercrete.

"With the growing reliance on horizontal directional drilling to support urban and infrastructure development, liquid epoxy polymer concrete remains a first-choice technology in the engineer's toolbox. DD 410 will join the Powercrete portfolio as a robust material for tackling the most demanding applications."

This latest Powercrete coating will reportedly be produced at the company's newest manufacturing facility in Houston, which opened in the spring of 2023.

PROFILES IN PAINT

From a

FAMILY COMPANY...



to a COMPANY FAMILY

J. Eric Sauereisen, President, Sauereisen Company,
Reflects on the Company's 125-Year History

This year, Pittsburgh-based protective coatings, linings and high temperature resistant materials manufacturing company Sauereisen will proudly celebrate its 125th anniversary of doing business. Founded as the Sauereisen Cement Company in 1899 by C. Fred Sauereisen, the company started with one singular product – Insa-Lute Adhesive Cement No. 1 – which became the foundation of the company's other product formulations.

From its original ceramics to corrosion-resistant coatings and linings, Sauereisen's product lineup expanded as the company – and the Sauereisen family itself – grew over the decades. In 1966, the company moved from its original plant in Sharpsburg, Pennsylvania, to its current headquarters at RIDC park in suburban Pittsburgh. A series of acquisitions – Nukem in 1982, Coatings Composites in 1992 and Pocono Fabricators in 2008 – helped necessitate an expansion at that facility in the early 2000s.

Today, Sauereisen manufactures corrosion-mitigating coatings and linings for the wastewater, oil and gas, food and beverage, power, mining and chemical processing industries, in addition to its long-standing ceramic compound applications.

Over the past 20 years, the company has received several awards, including a Congressional Award for Family Business of the Year in Western Pennsylvania in 2008,

Founded in 1899, Sauereisen's original products included concrete and ceramic formulations, before the company expanded into the corrosion industry.

the *Pittsburgh Business Times* Ethics Award in 2012, the Ernst & Young Entrepreneur of the Year, Family Business Award in 2013, the *Pittsburgh Business Times* Manufacturer of the Year in 2014, and three Presidential E-Star Awards for Export from the U.S. Department of Commerce in 1978, 2010 and 2019.

PHOTO (FACING PAGE): COURTESY OF SAUERISEN

JPCL recently spoke with C. Fred's grandson, Eric Sauereisen, who took over as president of the company in 2002, to discuss Sauereisen's origins and its evolution as a family-owned company, as well as guiding principles and emerging market trends for the company.

On evolving as a family-based enterprise:

Our grandfather had three sons that were eventually involved in the business – my father was the youngest of the three. However, our grandfather didn't get married and start family until his mid-40s, so he was always accustomed to acknowledging and including non-family management and decision-makers. Our ability to withstand the test of time comes down to a lot of different factors, but that simple act of sharing decision-making has been crucial.

You can look at the chronology of leadership of the company, starting with my grandfather, followed a non-family member, then a family member, then a non-family member to now myself as a third-generation family member. Our founder didn't always have the option or privilege of simply passing the business through family hands, and that paved the way for non-family members to grow with the company and have opportunities to lead. It's been a terrific strength of ours.

Sauereisen has been blessed to have people stay with us for a long time. We had an early accountant who was with us for 44 years. We've had a few "lifers" through the years, and a lot of our upper management has been homegrown. Over time, we've truly gone from a family company to a company family.

On changing industry technologies and product development:

My grandfather started the business with the classic American Dream. He had an eighth-grade education and got a job at

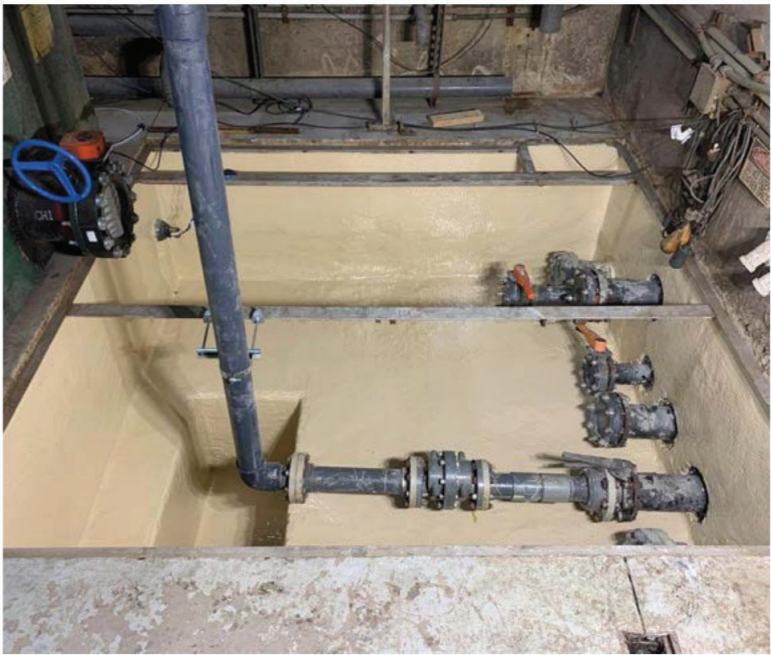
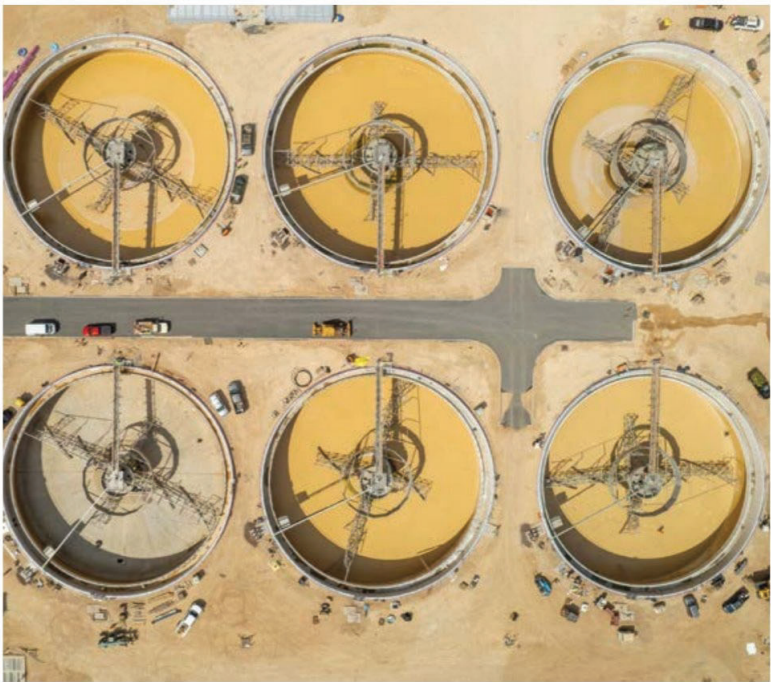
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We sell materials, but we also share our experiences, and we share out network of other industry contacts and resources. If we have a solution in our quiver, great—but if not, we can steer them toward another product or solution.”



Today, Sauereisen's corrosion-resistant coatings and linings are applied in the wastewater, oil and gas, chemical, food and beverage and other industries.

PHOTOS: COURTESY OF SAUERISEN



PROFILES IN PAINT

On a recent plant visit with one of the company's California-based representatives, current Sauereisen President J. Eric Sauereisen (*left*) and 30-year veteran Material Specialist Joe Keating (*third from left*) discussed products with Charlie Keating (*second from left*) and Joe Keating (*far right*) of J.A. Crawford.



a ceramics plant in East Liverpool, Ohio, where he developed an appreciation for the materials side of the business. He didn't want to keep working in the plant, but he gained an understanding of the different properties of different products.

Our roots are in ceramics and high-temperature adhesives and products, and those are still a meaningful piece of business. In the 1930s, the company segued from those into the corrosion industry, being based in western Pennsylvania around the steel and coal and other chemically aggressive local industries. To take advantage of those opportunities, our founder adjusted the early formulations to be used as an acid-proof mortar and monolithic.

While we've grown through internal product development and different acquisitions, and our customer and market base has grown, we've also come to learn that there's no single silver bullet for all corrosion applications. There are so many different variables, from the substrate, to the surface preparation, to the environmental conditions and everything else in between.

We make use of our company's research group, which provides QC/QA, product development, technical support and other services. We also train applicators in field on how to properly use our products.

We're often asked, where do you get the ideas for these new products? Some come from our customers who are looking for a

solution, some is our own creativity, but our suppliers are also an important piece in developing newer, safer technologies.

Ultimately, today we've got a broad product line, and the diversification of our industries has meaningfully helped us, and will help us continue on this path.

On industry experience being an important asset:

Based on the sheer amount of customers we've served and continue to serve, over time we've gone from a strictly material business to more of an information business. People call us because we work with mortars and monolithics, coatings and linings, polymer concretes and repair materials. They now turn to us as an information resource.

We sell materials, but we also share our experiences, and we share our network of applicators and other industry contacts and resources. If we have a solution in our own quiver, great – but if not, we can steer them toward another product or solution.

We don't want customers to call and say that a product isn't working. From the onset, we make sure we understand all the parameters of the client's challenges and deliver the best possible solution, and build a chain of dependability so that we can earn the client's long-term trust and value.

PHOTOS: COURTESY OF SAUERISEN

On some of the company's guiding philosophies over the decades:

Old-fashioned partnerships and relationships are vital. If you treat your team, your suppliers, customers and competitors with respect, and treat them fair, you'll be around for a long time.

Things can become fairly insular in this corner of a very large industry that we're in, but I believe that sharing best practices and mistakes is crucial. That even goes for our competitors – we have recommended their systems for different situations, and then some time down the line they might recommend ours. If you're willing to help someone else, good karma comes back your way.

It's important to always surround yourself with the best people you can find, from an attitude, experience and skills perspective. There's a cliché that, "if you're the smartest

person in the room, you're in the wrong room," and I think that holds true.

On finding and preparing Sauereisen's next generation of employees:

Finding talent has always been challenging, but it's getting easier and we will continue to add to our family here. We spend a considerable amount of time conducting training, both formal and informal.

As mentioned before, some growth is homegrown. A lot of good people and decision-makers came from the "farm team" or started in different areas of our company. We've been very fortunate from a longevity standpoint.

To fit within the culture is really important – and that extends to our customers as well as our own employees. If you have a good team and you maintain



Old-fashioned partnerships and relationships are vital. If you treat your team, your suppliers, customers and competitors with respect, and treat them fair, you'll be around for a long time.

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With an eye towards the environment, we'll continue our initiatives to design solutions for long-term service. Like our history, the goal for our clients and their installations is legacy.

a positive culture, you'll find and attract good customers.

In addition to skills, we look for people with humility and a sense of humor. Our company has a certain personality, and people might be really good candidates, but they have to fit with the culture. We want our employees to have fun with what they do and who they're with. Ultimately, you work hard for people that you like.

On trends for the future:

For our company, we'll aim to continue to push the envelope on product development and innovation. The most important market trends we see today are clean air and clean water, and being more mindful of safer and less harmful materials and applications.

The majority of Sauereisen's work is rehabilitation – we go in and repair prior efforts.

If stakeholders look closer at the inputs and total costs – not only materials, but also design, labor, logistics, equipment and energy – the value for a long-term solution rather than a “fix it” play becomes clear. If you address an asset the right way the first time, the carbon footprint is greatly minimized by not having to do it again.

Sustainability traditionally meant: How are we going to get our business three, or five, or ten years down the road? But by today's definition, its more all-encompassing than that. If, for example, we think about carbon reduction from the onset, and take waste out of the chain, we can optimize our decisions given the present resources.

Our technologies restore – and most of all, protect. With an eye towards the environment, we'll continue our initiatives to design solutions for long-term service life. Like our history, the goal for our clients and their installations is legacy. JPCL

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SURFACE PREPARATION



PHOTO: COURTESY OF THE AUTHOR



WET BLASTING EQUIPMENT

BY JON KENIMER, BLASTONE INTERNATIONAL

A Comparison for
Industrial Coatings
Contractors

SURFACE PREPARATION



Wet blasting, the process of introducing water to a mixture of pressurized air and abrasive, is now a mainstream process in the surface preparation field. While it has been referred to as other names, including

dustless blasting, mist blasting, slurry blasting or vapor blasting, wet blasting uses a mixture of water and abrasive media to create a surface profile prior to coating application – making it distinct from ultra-high-pressure (UHP) waterjetting, which does not include abrasive and does not create a surface profile.

The “why” and “what” of wet blasting is generally well understood. Simply put, only two words are needed: “dust mitigation.” While it is true that there are other ways to reduce dust (*see box, below*), adding water to the blast stream is often required to keep dust in check when abrasive blasting.

Less clear, however, is the “how” of wet blasting. This article will examine and compare the various technologies and equipment currently available for these applications in the industrial coatings market.

DUST MITIGATION ALTERNATIVES

Water is not always required to gain a satisfactory level of dust mitigation. Here are a few other options:

- **Use a low-dust media.** The cheapest media is generally the dustiest. The difference can be dramatic. Also, using a high-performance media often has other benefits too, including faster production, lower consumption, and/or a cleaner blasted surface.
- **Use a vacuum blaster.** Specialized blast-and-vac (BNV) systems combine a vacuum and a blast nozzle into a single workhead. Dust reduction is near total and water isn't needed. However, BNV technology is slow and is best used for spot work.
- **Use containment.** The use of containment with dust collection, although it can be expensive, allows the use of dry blasting.

Wet abrasive blasting was introduced over 50 years ago, so it is not a new concept. Technology is evolving however, and options now exist that offer faster production as well as lower water consumption versus older technologies.

Before we examine the various methods of wet blasting, let's look at two common scenarios where wet abrasive blasting equipment may be needed.

1. An entrepreneur is starting a field painting/abrasive blasting company and wants to be prepared to provide wet blasting services as well as dry.
2. An established industrial painting contractor wants to add wet abrasive blasting to their range of services or may want to improve their efficiency in this area.

For these purposes, there are three common types of wet blasting equipment options on the market today. Let's review and explore the pros and cons of each.

Slurry Blast Equipment

This is a category of blasting equipment where water and abrasive are mixed inside the blast pot. Some versions are designed for wet blasting only, while others can blast wet or dry.

With slurry blast equipment, because the water and media are mixed in the tank, no air dryer is required. As a result, using media that has gotten wet is OK, which can be beneficial.

However, this type of equipment cannot independently control the abrasive and water ratio; this must be carefully managed manually. For example, if production needs to be increased due to a particularly thick



or tough coating, the operator will increase the flow of the abrasive/water mixture. While this will increase production speed due to the higher level of abrasive, the water consumption will also increase. If production needs to be decreased due to working on a sensitive substrate such as concrete, where the underlying aggregate may become exposed, turning the abrasive down will also turn down the water possibly reducing the dust mitigating effect of the water too much. Also, slurry blast equipment produces higher water consumption rates than hybrid units. Lastly, some slurry blast configurations do not have the ability to blast dry.

Hybrid Blast Equipment

In this category, the abrasive is always dry in the blast pot. When wet blasting, water is injected at the metering valve or at the nozzle. Hybrid pots are quite versatile; they can blast dry, blast wet, blow down, or wash down. When combined with a bulk pot with multiple operators, each operator

can even choose their desired function independently of the others. There are other considerations which will be reviewed later in this article.

Designed to do both wet and dry blasting efficiently, hybrid units are versatile, not a limited-purpose specialist machine. Overall, they have the lowest water consumption and highest productivity in this group.

On the con side, because the blast pot is dry, an air dryer is required, adding cost to the already pricy technology for companies who do not currently have one.

Nozzle-Mounted Injectors

These versions use a separate water line, which connects at the nozzle. There are two main types: a Water Induction Nozzle (WIN), which is a nozzle designed specifically for wet abrasive blasting; and a Halo (water ring), which is a device that attaches to a standard nozzle.

These smaller, compact units carry a very low upfront cost. However, nozzle-mounted

One major benefit of wet abrasive blasting is the potential of reducing or eliminating the cost of containment.

SURFACE PREPARATION

TABLE 1: Equipment Specs and Considerations for Generic Wet-Blasting Equipment Types

MACHINE	MSRP	POT SIZE	TANK SIZE	POT TYPE	VALVE TYPE	EMPTY WT	STANDARD CONTROLS
WHEEL MOUNTED							
Axxiom AmphiBlast Lite	\$25,254	3.5 CF	15 gal	Dry/Hybrid	TeraValve	270 lbs	Pneumatic (option for electric)
BlastOne MistBlaster MB25000 Base Unit	\$20,855	6.5 CF	Optional 50 or 275 gal	Dry/Hybrid	TeraValve	548 lbs	Dual (electric/ pneumatic)
Dustless Blasting DB500 Base Unit	\$12,500	5 CF	20 gal (in pot)	Dry/Slurry	Abrasive Control Lever	368 lbs	Pneumatic
Dustless Basting DB800 Base Unit	\$15,500	8 CF	30 gal (in pot)	Dry/Slurry	Abrasive Control Lever	427 lbs	Pneumatic
SKID MOUNTED							
Axxiom AmphiBlast Standard, Single Outlet	\$31,024	4.5 CF	80 gal	Dry/Hybrid	Thompson II	850 lbs	Pneumatic (option for electric)
Axxiom AmphiBlast Standard, Double Outlet	\$51,281	6.5 CF	165 gal	Dry/Hybrid	Thompson II	1350 lbs	Pneumatic (option for electric)
BlastOne MistBlaster MB20000 Base Unit	\$24,970	6.5 CF	Optional 50 or 275 gal	Dry/Hybrid	TeraValve	748 lbs	Dual (electric/ pneumatic)
BlastOne MistBlaster MB40000 & MB60000, Combo Skid Series	Option Dependent	6.5 CF	50 gal	Dry/Hybrid	TeraValve	Option Dependent	Dual (electric/ pneumatic)
Clemco WetBlast Flex #2448 Base Unit	\$24,580	6 CF	120 gal	Dry/Hybrid	AQV Auto Quantum	1500 lbs	Pneumatic
Greener Blaster GBT760	\$30,500	7.6 CF	100 gal	Slurry	Control Panel Knob	1030 lbs	Pneumatic
Greener Blaster Dual Outlet	\$53,000	12 CF	100 gal	Slurry	Control Panel Knob	1800 lbs	Pneumatic
BULK							
Axxiom Bulk AmphiBlast	Option Dependent	45, 120 or 160 CF	Optional 275 gal	Dry/Hybrid	Thompson II or TeraValve. 2, 3 or 4 valves	Option Dependent	Electric
BlastOne Mega MistBlaster	Option Dependent	160 CF	Optional 275 gal	Dry/Hybrid	TeraValve. 2 or 4 valves	Option Dependent	Electric, includes timers

Author's Note: Graco EcoQuip slurry blasters have been discontinued by the manufacturer and Farrow Systems has no models currently offered at the time of this writing.

Editor's Note: The information presented in this table is solely a survey of the wet abrasive blasting equipment currently available on the market. It does not assess the performance or efficiency of any equipment type. JPCL does not endorse any specific products included in this table.

injectors have limitations which significantly impact their viability for industrial applications. The water-ring types use a large amount of water and the injection type negatively impacts production speed.

Technical Comparison

There are several manufacturers of wet abrasive blasting equipment and much to consider when selecting the right product for the right job. **Table 1** (*previous page*) features equipment specs and considerations for various wet blasting equipment types.

Final Purchase Considerations

Now that you're aware of the different types and sizes of wet blasting equipment available, let's run through a list of questions to ask to make sure you're selecting the most practical equipment setup for your wet blasting needs.

WHAT METERING VALVE DOES THE EQUIPMENT HAVE?

The metering valve is the heart of any blast machine. In the average lifespan of a blast pot, the value of the abrasive that will go through any pot can easily exceed \$100,000. A valve that offers a high degree of fine metering control (allowing the operator to minimize consumption while maximizing production) may cost a few hundred dollars more up front, but can save many thousands in abrasive over the life of the pot.

Metering valves are not all created equal. Fine metering control is just one of the important aspects. Other items to consider about the metering valve include:

- How long do they last?
- How easy are they to unclog?
- How easy are they to repair/rebuild?
- How new is the technology in it?

These questions are nearly impossible to answer without speaking with a knowledgeable sales rep, technician, or user who has used more than one type.

WHAT IS THE EQUIPMENT'S PRESSURE EFFICIENCY?

How much pressure drop is there from the inlet of the pot to the outlet? If the metering valve is the heart of any blast machine, PSI is the heart of productivity. It is simple to test and profoundly important to understand what (if any) pressure drop is caused by the piping and valve of the blast machine. It isn't uncommon for machines to have a 10 PSI pressure drop and, in this example, the production speed will be 15% slower than one without any pressure drop. These pressure drops are insidious and difficult to identify without doing nozzle pressure checks or without doing timed comparisons between different equipment.

A valve that offers a high degree of fine metering control may cost a few hundred dollars more up front, but can save many thousands in abrasive over the life of the pot.

WHAT SUPPORT CAN YOU EXPECT FROM THE MANUFACTURER OR DISTRIBUTOR?

You can't just look at the manufacturer's website. You need to pick up the phone and call them. As far as the equipment is concerned, do they offer field support

CONT. NEXT PAGE

EXPERT OPINION

What else do I need to know? We asked Ben Fording, a field sales representative with over 10 years' experience at BlastOne International, to share a few points and opinions gleaned from his experience in selling wet abrasive blast equipment into many different project situations.

1. One major benefit of wet abrasive blasting is the potential of reducing or eliminating the cost of containment.
2. Water consumption is a big consideration, especially when blasting steel. It is standard practice to use a rust inhibitor in this application and that is not inexpensive. Slurry-type blasters inevitably use more rust inhibitor than the hybrid types. Even when blasting concrete and therefore not using rust inhibitor, excess water creates a mess to work in and potentially to clean up. High-quality hybrid units offer the key capability of being able to adjust water flow separately from abrasive flow. This allows the operator to adjust water flow to keep the abrasive just damp enough to mitigate the dust while still allowing the abrasive flow to be adjusted to achieve the optimal speed and consumption for the given field conditions.
3. Regardless of what may be claimed, wet abrasive blasting is always slower than dry blasting when comparing apples-to-apples. In addition and contrary to some claims, water does not do any of the blasting work—its sole function is to mitigate dust.
4. Hybrid units are unquestionably the best equipment for industrial projects. For small projects, production speed is less of a factor, and water/inhibitor consumption aren't that high anyway, so the less costly slurry and nozzle options may be viable. But without a doubt, large wet blast abrasive projects will be most economical overall when done with hybrid equipment.



Ben Fording



or just phone support? Qualified field support (both to optimize job setup as well as for equipment maintenance) can mean the difference between profit and loss on your projects. Possibly even more importantly, can they offer real-world assistance on best practices on the type of projects you want to pursue? Regardless of whether you are an old-timer in the blasting game or a greenhorn, there's always something new to learn. Look for a company who can offer suggestions on abrasive comparisons, nozzle types, hose sizes, job safety, how to bid projects and any other questions you may have.

HOW VERSATILE IS THE EQUIPMENT?

Does your blaster offer the ability to blast dry and if so, how well does it perform at this? Dry blasting is the preferred way to blast whenever possible and is much more commonly done. A limited purpose wet-only blaster (or one that isn't efficient at blasting dry) will tend to gather dust in your warehouse, lowering the return on your investment substantially.

CAN YOU TRY BEFORE YOU BUY?

Does the manufacturer or distributor offer field demos and/or equipment rental? This is a great way to test and find out more

PHOTO: COURTESY OF THE AUTHOR



Conclusions

While this article can help supplement your research into specific wet blasting equipment, you should also seek out advice from real-world product experts. Ask your potential supplier for referrals, especially if they have any that have “converted” from other brands. Here are five questions to ask when you connect with a referral:

1. How long have you had the equipment, and how often do you use it?
2. What are the best points about the equipment/supplier?
3. Are there any issues that haven't been resolved, or limitations/problems that may be a concern to a new user?
4. Knowing what you now know, what is the likelihood that you would buy it again?
5. Any other comments or suggestions?

You can't just look at a website. You need to pick up the phone and call the manufacturer and distributor to learn what kind of support you can expect from them.

As with most products marketed and sold in the U.S., a variety of good options fortunately exist because of our free market economy. A wet abrasive blast machine purchase is a major investment and what type you want or need is dependent on your specific situation. But remember this: The initial cost is far less important than the ongoing operating cost and the support available from your supplier. **JPC**

about your chosen equipment (and your supplier). Actually using the equipment on a demo site or out in the field for a day will help you learn more about the equipment than you could doing a week of other research on it.

DOES IT PASS THE ACID TEST?

How many machines of your selected model are available on the used market? A disproportionately high number of a given model or manufacturer is a warning sign. Compare pricing for used versus new – how much depreciation is there in your top choices?

ABOUT THE AUTHOR



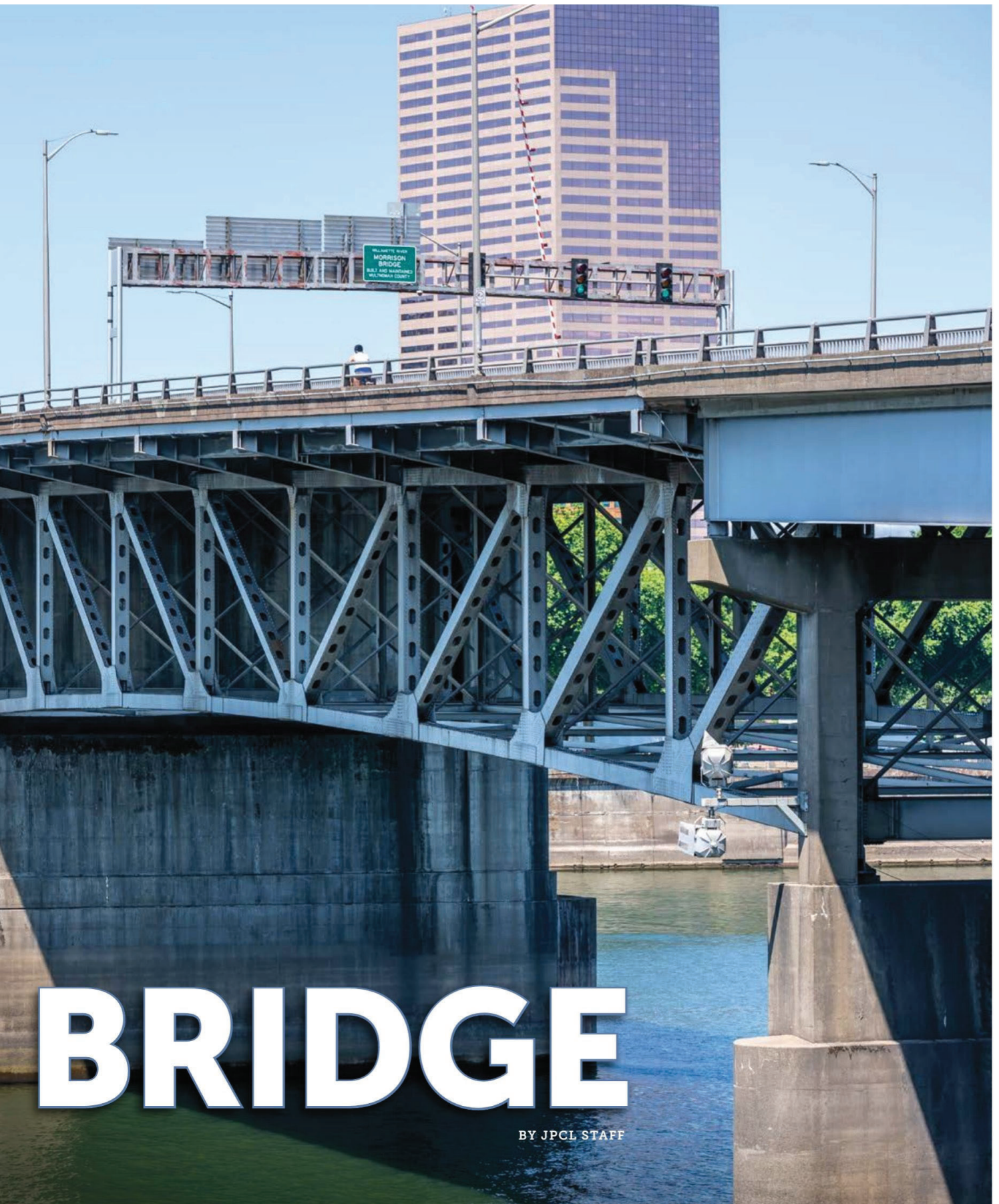
Jon Kenimer is a Product Manager in the U.S. for BlastOne International. Since joining BlastOne in 2014, he has held diverse roles, including Commercial Manager to Project Manager and Sales Representative,

culminating in his current role. A seasoned veteran of the corrosion control industry, Kenimer has resided in Columbus, Ohio, since 1972, where three of his six children are also employed with BlastOne.

L

ast summer, crews on the Morrison Bridge in Portland, Oregon, finished a two-year-long repainting project, which included around 2,000 gallons of paint and roughly 5,000 hours of work. The completed project reportedly marks the first time the bridge has been painted since its construction 66 years ago. According to a report from the Multnomah County Transportation Division, the \$26 million project gives a new, “fresh” look to the bridge, while also providing a safer crossing for the local community.

Repainting the **MORRISON**



BRIDGE

BY JPCL STAFF



The bridge had not been painted since its original construction, and the steel and coatings were showing signs of deterioration.

About the Bridge

The Morrison Bridge, which stretches over the Willamette River, acts as a gateway to downtown Portland and replaced two previous Morrison bridges, constructed in 1887 and 1905, respectively. Completed in May 1958, the current Chicago-type double-leaf bascule bridge now connects to interstates, making it a major transportation corridor.

Designed by Sverdrup/Parcel of St. Louis, and Moffatt, Nichol and Taylor of Portland, the main river truss spans and draw spans were constructed by the American Bridge Division of the U.S. Steel Co., Manson Construction and Engineering. The structure includes six lanes of traffic, carrying 50,000 vehicles daily.

The bridge consists of two 237-foot, nine-inch steel deck truss side spans and a 284-foot, six-inch double-leaf bascule draw span, for a total bridge length over the river of 760 feet. The bascule span reportedly only requires opening about 30 times per month.

The most recent modifications before the latest project took place in 2011, with the replacing of the lift span deck, as well as adding a shared use path on the south side and overlaying the east approaches.

Project Bidding, Preparation

The project was initially estimated to cost \$20 million, with 90% being financed by the federal government and county taxpayers paying the remainder.

In July 2021, Multnomah County selected a Florida-based protective coatings contractor to be the general contractor for the project. According to reports, the contractor submitted the lowest responsive



“Because the old paint contains lead, crews must follow rigorous environmental protocols, which includes using a large industrial vacuum to prevent the paint from falling into the river.”

— Kenneth Huntley, Project Manager

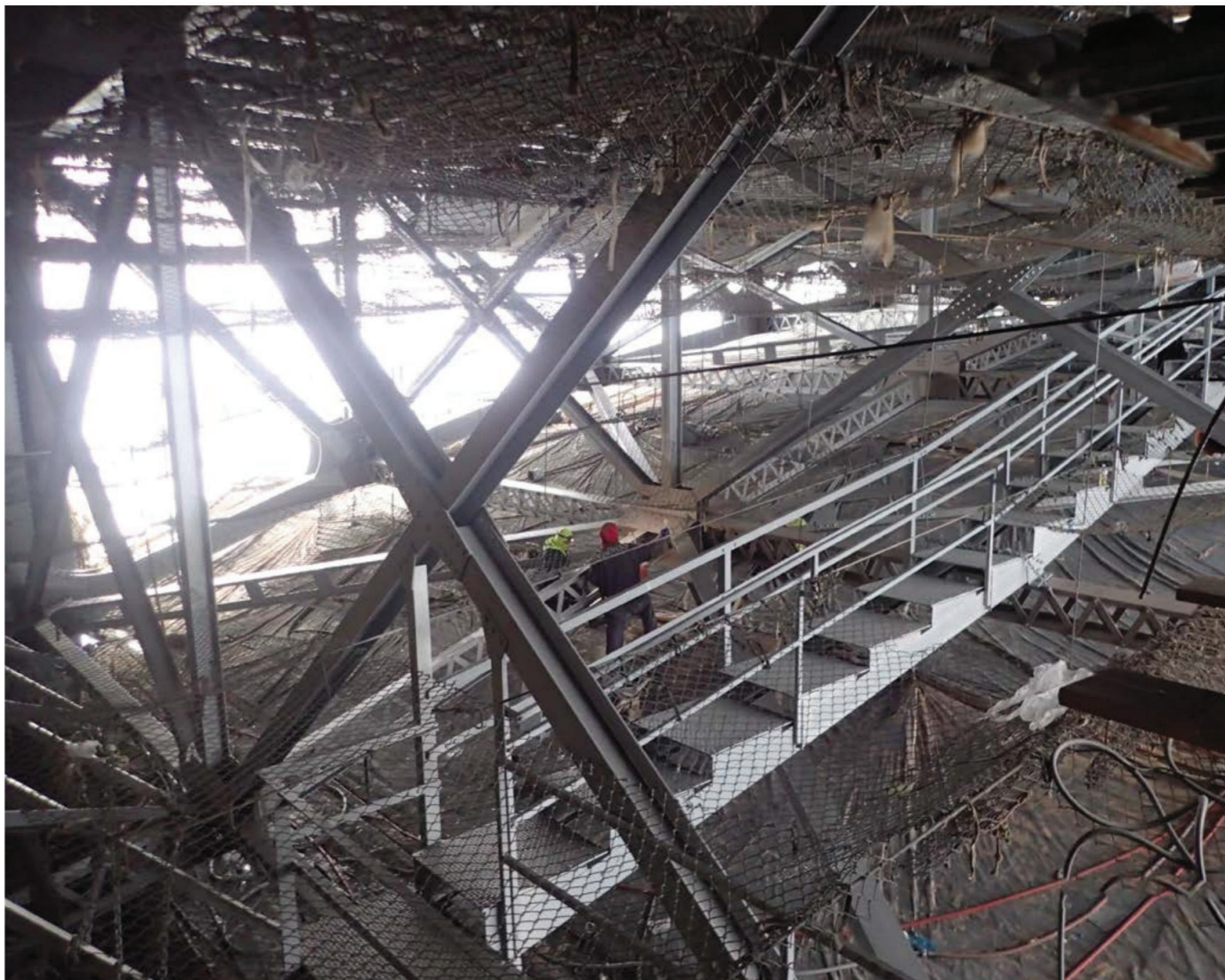
The steel was abrasive blast-cleaned to a Near White Metal finish before being coated with a three-coat system.

bid of six contractors at a bid of \$18,243,777.

The project started at the beginning of 2022, with the closure of an on-ramp to allow space for equipment and installation of a platform for painters working beneath the six-lane span. Work was reportedly focused on the underside of the five river spans on the structure, primarily below the deck. These spans

include the center movable span, two flanking truss spans and two girder spans above the river to the east, with the easternmost girder span partially over land.

The bridge deck itself would reportedly not be repainted, except for metal parapets and curbs near the movable span. Additional work would also reportedly include replacement of the sidewalk panels



The blasting and coating application work took place under containment to encapsulate the existing lead-based coatings and any potential overspray.

on the lift span, and cleaning of the canopies, handrails and exterior of the operator towers.

Work Begins

In October 2022, the bridge was officially closed for the multiyear painting project. The steel on five river spans was to be repainted throughout the project, as well as any additional repairs and lead paint removal.

From Oct. 14 to 17 of that year, the bridge was closed to allow the contractor to paint the east side of the bridge, in addition to removing, inspecting and replacing steel beams. Existing paint was reportedly

peeling and had to be removed to avoid corrosion of the structural steel members.

The bridge's old paint was reportedly lead-based, leading each section of the bridge to be fully encased to prevent the removal process from harming the surrounding environment. After the old paint was removed, existing corroded steel was then reportedly replaced before the span was repainted. The newly painted spans are now reportedly lead-free.

According to the report, crews had to work on safety platforms roughly 50 feet in the air to paint the structure, while also wearing

“extensive” protective gear. Three coats of paint were reportedly applied to the bridge, including a zinc primer coat, an intermediate coat for added protection and then a final finish coat.

“Because the old paint contains lead, crews must follow rigorous environmental protocols, which includes using a large industrial vacuum to prevent the paint from falling into the river,” said Project Manager Kenneth Huntley.

Project Progression

The newly applied protective coating system now has an aluminum grey finish, meant to honor the bridge’s original color and its history, beginning with its construction in 1957.

As a part of the project, crews had reportedly performed a structural analysis on the bridge’s steel members, identifying and repairing damaged steel sections and increasing the life of the bridge by several years. Crews were reportedly able to make over 20 steel repairs to strengthen to bridge, while also repainting the sign structures over it and replacing all the old signs to make traffic and safety messaging more visible.

In addition to painting the Morrison Bridge, several repairs to steel members were identified and included as part of the project along with other improvements. During the blasting and cleaning of the old paint, several locations on the bascule spans were discovered to have much more severe section loss in critical steel truss members than originally thought. This discovery led to change orders to implement repairs, ensuring the structural integrity of the bridge. Even with all the field issues on the project, the contractor was on time and on budget, and the painting was completed in July 2023.

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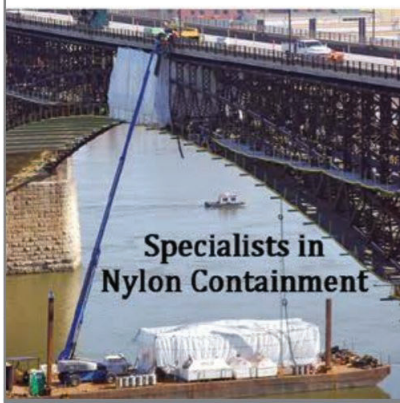


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FROM THE FIELD



“The newly applied protective coatings system now has an aluminum grey finish, meant to honor the bridge’s original color and its history, beginning with its construction in 1957.”

“After more than 60 years, the Morrison Bridge was in desperate need of a new coat of paint,” Huntley said.

“We were able to not only repaint the bridge, but we also found several seriously damaged steel sections through inspections that we were able to fix. These repairs extended the life of the bridge significantly.”

According to the report, the project had also provided thousands of hours of learning opportunities, as three separate apprenticeships worked with the contractor to total around 3,600 hours of training.

PHOTO: COURTESY OF MULTNOMAH COUNTY TRANSPORTATION DIVISION



The engineering and contracting teams celebrated successful completion of the project.

Additionally, three different Disadvantaged Business Enterprise (DBE) organizations also reportedly worked on the project as subcontractors.

As work on the exterior of the bridge is finished, the County is reportedly beginning to work on another project on the same structure.

The Morrison Bridge Strengthening Project will reportedly improve the southeast Morrison Street and the southeast Belmont Street ramps to the bridge to reduce weight restrictions, currently preventing heavy trucks from using the bridge. The project will also

include the replacement of the motors and brakes in the movable span, which helps open and close the bridge.

Construction for that project is reportedly expected to run from spring 2024 to fall 2025. JPCL

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PROJECT AWARDS

The **Kentucky Transportation Cabinet** has awarded a \$4,231,231.35 contract to Intech Contracting, LLC (Lexington, Kentucky) for cleaning and coating the two existing spans of the Daniel Carter Beard Bridge along Interstate 471 over the Ohio River between Newport, Kentucky and Cincinnati. The twin-span bowstring steel arch bridge opened in 1976 has a 750-foot-long main span and a total length of almost 2,100 feet.

The project involves surface preparation and application of a three-coat epoxy-based organic zinc-rich system on steel bridge surfaces. Steel cables will also require application of a three-coat epoxy-urethane system. Surfaces will require preparation in accordance with standards for Power Tool Cleaning (SSPC-SP 3), and Near-White Metal Blast Cleaning (SSPC-SP 10/NACE No. 2). The existing coatings may contain lead; Class 2A containment according to SSPC-Guide 6 is required. The contractor is responsible for performing quality control coatings inspection services, including the provision of an SSPC C-3 qualified individual to oversee waste handling. The approved coating manufacturers for this project include Carboline, PPG and Sherwin-Williams.

Intech was the lowest of two apparent bidders; M&M Services Co., Inc. (Mount Sterling, Kentucky) also submitted a bid for the project in the amount of \$4,314,820.

ASR Construction Group LLC (Gilbert, Arizona) recently secured a \$493,443 from **Lake Havasu City, Arizona**, for a project that includes coating application and performing various upgrades to an existing booster station.

The project involves applying a five-coat high-build epoxy system on interior and exterior non-submerged ferrous metal surfaces; a two-coat epoxy system on aluminum and galvanized metal; a three-coat epoxy-polyurethane system on PVC and related surfaces; a four-coat epoxy system on buried galvanized metal surfaces; and a six-coat epoxy system on interior and exterior submerged ferrous metal surfaces. Specified surfaces will require shop and field priming or touch-ups.

Surfaces will require preparation in accordance with standards for Solvent Cleaning (SSPC-SP 1), Hand Tool Cleaning (SSPC-SP 2), Power Tool Cleaning (SSPC-SP 3), White Metal Blast Cleaning (SSPC-SP 5/NACE No. 1), Commercial Blast Cleaning (SSPC-SP 6/NACE No. 3), and Near-White Metal Blast Cleaning (SSPC-SP 10/NACE No. 2).

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PHOTOS (FROM TOP): COURTESY OF KENTUCKY TRANSPORTATION CABINET; COURTESY OF LAKE HAVASU CITY

Approved coating manufacturers include Ameron, Carboline, Futura Coatings, Glidden, ICI Devco, International Protective Coatings, Keeler & Long, Kop-Coat, Polyken, PPG, Raven Lining Systems, Santile, Sauereisen and Tnemec.

Additional bids submitted included:

- Technology Construction Inc. (Bullhead City, Arizona) at \$615,000;
- Schofield Civil Construction, LLC (Phoenix) at \$686,000; and
- Walker River Construction Inc. (Schurz, Nevada) at \$693,693.

The **Vermont Agency of Transportation** has awarded a \$32,677,624.45 contract to Beck & Bellucci, Inc. (Franklin, New Hampshire) for cleaning and coating of an existing bridge structure along Interstate 89 in Royalton. The project involves lump sum items for cleaning and painting structural steel, as well as applying 462 gallons of silane water repellent.

Steel surfaces will receive a three-coat system consisting of an organic zinc-rich primer, epoxy intermediate and an aliphatic urethane topcoat. Surfaces will require cleaning and preparation in accordance with standards for Near-White Metal Blast Cleaning (SSPC-SP 10/NACE No. 2) or Commercial Blast Cleaning (SSPC-SP 6/NACE No. 3). The contractor will also oversee removal, containment and disposal of lead paint. Containment and disposal of hazardous material is required in accordance with certifications for SSPC-QP 1 and QP 2. Certifications for SSPC-AB 1 and AB 3 are also required.

The project also includes concrete patching and repairs, removal and rebuilding of expansion joints and miscellaneous site work.

The owner-approved coating manufacturers for this project include Kretetek Industries, BASF, Vexcon, Evonik, Advanced Chemical Technologies, Prosoco and Dayton Superior.

Beck & Bellucci, Inc. was the lowest of two apparent bidders, in addition to Engineers Construction, Inc. (South Burlington, Vermont) in the amount of \$35,665,340.

PROJECT PREVIEW

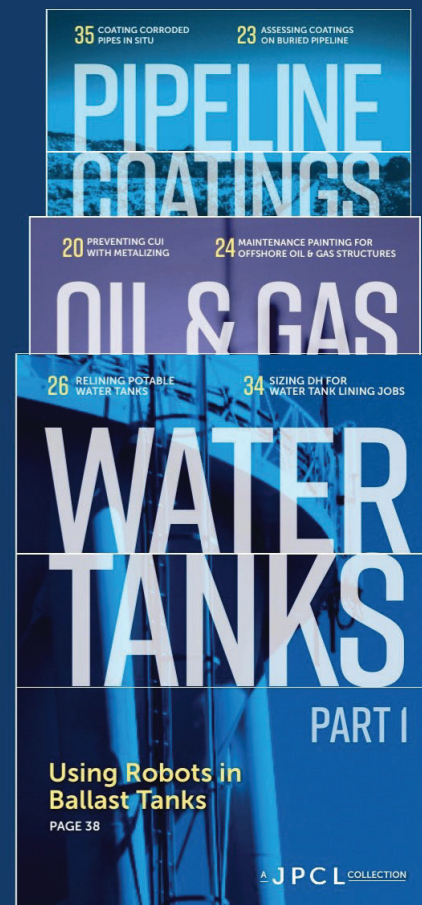
The **Bartow Airport Authority** is soliciting bids for the construction and coating of a new T-Hangar building at the Bartow Executive Airport in Bartow, Florida.



The project involves galvanizing steel surfaces with a hot-dip zinc coating. Specified steel surfaces will require factory priming with latex, epoxy and zinc coating systems, and field painting with a urethane topcoat. Surfaces will require preparation in accordance with standards for Hand Tool Cleaning (SSPC-SP 2) and Power Tool Cleaning (SSPC-SP 3). Removal of any existing structures is also required.

The submittal date for this project is March 7. A non-mandatory pre-bid conference is scheduled for Feb. 8 at 10 a.m. at the Bartow Executive Airport Terminal Building Conference Room, located at the project site. The pre-bid conference may also be attended virtually by contacting Ryan Signorin at ryan.signorin@aecom.com to receive an invitation to screenshare.

PHOTO: COURTESY OF BARTOW AIRPORT AUTHORITY



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18

The number of JPCL feature articles published last year that are eligible for the 2023 Readers' Choice Awards—the top articles of the year, voted on by JPCL readers. P1

\$32.6M

The value of a recently awarded contract from the Vermont Agency of Transportation for cleaning and painting of a highway bridge structure. P36

3

The number of conventional equipment types—slurry blast, hybrid blast and nozzle-mounted injectors—reviewed in an article on wet abrasive blasting. P18

125 yrs.

The length of time that coatings and materials manufacturer Sauereisen Company has been in business in the industry since its founding in 1899. P10

75%

The percentage of respondents to a recent PaintSquare Poll who believe that new corrosion sensors could potentially help extend coating life on in-service infrastructure. P7

2,000 gals.

The approximate amount of coating material applied to the Morrison Bridge in Portland, Oregon, during a recently completed painting project. P26