# JPCL

JOURNAL OF PROTECTIVE COATINGS & LININGS



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# 2023 EVENT PLANNER

Mark your calendars for these upcoming protective coatings industry events. See details and updates at the following conference and organization websites.

**World of Concrete 2023**
Jan. 16–19, Las Vegas
worldofconcrete.com

**50th Annual Waterborne Symposium**
(University of Southern Mississippi)
Feb. 12–17, New Orleans
waterbornesymposium.com

**AMPP Annual Conference + Expo**
March 19–23, Denver
ace.ampp.org

**NASCC: The Steel Conference** (AISC)
April 12–14, Charlotte, North Carolina
nascc.aisc.org

**European Coatings Show 2023**
March 28–30, Nuremberg, Germany
european-coatings-show.com

**CPCA 110th Annual Conference**
May 24–26, Niagara-on-the-Lake, Ontario
canpaint.com

**AWWA ACE23**
June 11–14, Toronto
awwa.org

**International Bridge Conference 2023**
(Engineers' Society of Western PA)
June 12–14, National Harbor, Maryland
eswp.com/bridge

**ACA CoatingsTech**
Conference 2023
June 26–28, Cleveland
paint.org

**2023 DoD Corrosion Prevention Technology and Innovation Symposium** (AMPP)
Aug. 14–17, Tucson, Arizona
dodcorrcon.org

**2023 Polyurethanes Technical Conference**
(American Chemistry Council)
Sept. 25–27, San Antonio
americanchemisty.com

**WEFTEC 2023**
Sept. 30–Oct. 4, Chicago
weftec.org

**WJTA Conference & Expo 2023**
Oct. 30–Nov. 1, New Orleans
wjtaexpo.com

**6th Annual TPC Connect: Industrial Coatings**
(Formerly Contractor Connect) Hosted Buyer Event
Nov. 7-10, Henderson, Nevada
tpc-connect.com/ic

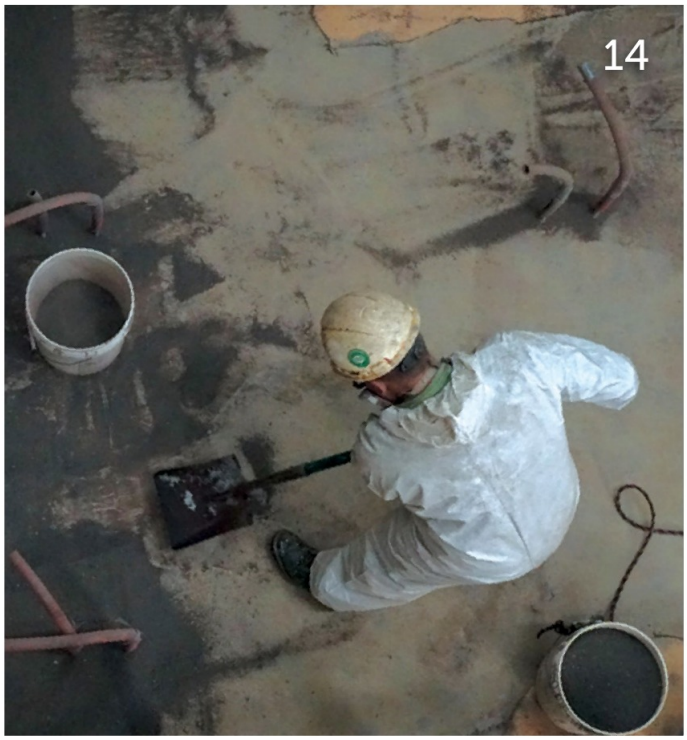
**International WorkBoat Show 2023**
Nov. 29–Dec. 1, New Orleans
workboatshow.com

*Information was current as of press time and is subject to change.*

DECEMBER 2022

# JPCL

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BY JIM MARSTON, MARSTON INDUSTRIAL SERVICES

This article goes through the steps of a project involving rehab on three concrete sludge tanks, highlighting how the four-man contracting crew was able to use sponge media abrasive to remove the existing rubberized coating and create the proper surface profile for the application of a new epoxy coating system.

**28 2022 JPCL Coatings Systems Buying Guide for Concrete**

The annual JPCL Coating Systems Buying Guide for Concrete serves as a resource for facility owners, third-party specifiers, contractors and anyone else engaged in a coatings project and allows the user to identify systems that companies recommend for specific applications, exposures, substrates and specialty functions.

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# Axalta Names New CEO

Liquid and powder coatings supplier Axalta Coating Systems Ltd. recently announced the appointment of Chris Villavarayan as Chief Executive Officer and President and member of its Board of Directors. The change is effective Jan. 1, 2023.

Rakesh Sachdev, who has served as interim CEO and president, will succeed Bill Cook as non-executive board chair. Cook will serve as an independent director and become Chair of the Board's Compensation Committee, while also continuing to serve on the Audit Committee.

"On behalf of the entire Axalta Board and management team, I am delighted to welcome Chris as our company's next CEO, and I want to thank Rakesh for his leadership during the transition period," said Cook. "Chris's appointment follows a comprehensive search process to identify a strong leader for the company, and he joins Axalta with the full support of our Board.



Chris Villavarayan

"Chris is a seasoned executive who will bring to Axalta his global operating experience, deep expertise in product development and manufacturing and a proven record of driving outstanding business results. Over the course of his career, Chris has distinguished himself by defining and executing innovative and forward-looking growth strategies. We are confident that he will be an outstanding CEO with the skillsets necessary to achieve our strategic objectives and accelerate shareholder value."

According to the company's release, Villavarayan brings more than two decades of operational and management experience in industrial sectors. Most recently, he has served as CEO and president of Meritor, Inc. Additionally, he has an "established track record of driving growth, expanding margins and managing complex global operations resulting in significant shareholder value creation."

"We have every confidence that, under Chris's leadership, Axalta will be better positioned than ever to successfully execute our strategic imperatives to drive profitable growth," said Sachdev. "I want to thank Bill for his exceptional service as Board Chair, and I am honored to step into the role at the start of the new year. I look forward to working closely with Chris and the Board to generate meaningful value for shareholders."

"Chris is a seasoned executive who will bring to Axalta his global operating experience, deep expertise in product development and manufacturing and a proven record of driving outstanding business results."

Prior to his most recent position as CEO at Meritor, Villavarayan held positions as chief operating officer, senior vice president and president – Global Truck and president – Americas. Prior to its acquisition by Cummins Inc. in August 2022, Meritor reportedly had global sales of approximately $4 billion.

"I am excited to join Axalta, a company with a proud 150-year history that I have long admired. I am eager to leverage my experience to build on the team's work to

PHOTO: COURTESY OF AXALTA

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position the business for accelerated growth and market leadership," said Villavarayan. "I look forward to working alongside the Board, Axalta's management and the global team to lead the company toward realizing its strategic value to benefit all our stakeholders."

Villavarayan earned his bachelor's degree of civil engineering from McMaster University, as well as completed the Wharton Executive Education Advanced Finance Program. He currently serves as a director on the board of Franklin Electric and Focus: HOPE, a Detroit-based, non-profit organization.

## ChemQuest Appoints New Senior VP

Global business strategy and external specialty chemicals technology development firm The ChemQuest Group Inc. recently announced the appointment of Abe Rezai as Senior Vice President. The appointment took effect Nov. 1.

According to the emailed release, in his role, Rezai will support strategy development and key client engagements for the firm, including projects related to business transformation, technology development and advisement for mergers, acquisitions and divestitures.

ChemQuest reports that Rezai has more than 40 years of background experience in technical and executive management roles for global organizations within the specialty chemicals and consumer products industries. Most recently, he served as vice president and chief technology officer for Sekisui Fuller, as well as previously holding roles with H.B. Fuller and Procter & Gamble.

Rezai reportedly has a track record of successfully delivering breakthrough business results, building collaborative relationships, developing and executing global commercialization strategies and leading organizational transformation.

"In the years I have known Abe, he has consistently demonstrated a deep knowledge of the inner workings of successful organizations. He knows which levers to pull to drive



success, including innovation, transformation, IP strategy, manufacturing systems and processes," said Daniel Murad, ChemQuest President and CEO. "He is also an expert and thought leader for industries that are essential to ChemQuest's knowledge base and 2025 strategy, primarily hygiene, consumer products, adhesives and sealants."

"ChemQuest has an outstanding reputation for having trustable and reliable insights and perspectives in the area of specialty chemicals. The company has enabled this market to grow and prosper with the information, solutions and recommendations that it has provided to its members for years. I look forward to contributing to ChemQuest's mission," Rezai said.

Rezai holds a Ph.D. in organic chemistry from the University of Missouri, Columbia. He reportedly went on to become a faculty member of Northwestern University for organic chemistry, in addition to authoring numerous peer-reviewed publications.

As an inventor, Rezai has over 100 patents related to specialty chemistry and commercial products. He is reportedly based in Huntington Beach, California, and speaks English, Farsi and Japanese.



Abe Rezai



# Report: Industrial Floor Coating Market to Grow

The global floor coating market is anticipated to grow to $5.5 billion by 2030, a recent research report predicts, with the market already valued at $3.1 billion in 2020. According to the forecast from Allied Market Research, the market will grow at a compound annual growth rate (CAGR) of 6% over the next several years.

Additionally, a recent report from market.us estimates that the industrial floor coating market will exhibit a 7.4% CAGR from 2022 to 2031, after being valued at $4.74 million in 2021. This includes the epoxy, polyamide, polyurethane and two-component industrial flooring markets.

The Allied report is segmented into floor structure, end user, binder type, coating component and by region. "The growth in the construction sector and increased usage of coatings in industrial, commercial and residential applications are the crucial factors that drive the floor coatings market growth," reads the report. "Furthermore, rise in population along with surge in industrialization across the globe has bolstered the demand for floor coatings."

In a recent analysis from the Associated General Contractors of America, total construction spending (not adjusted for inflation) totaled $1.795 trillion at a seasonally adjusted annual rate in October. Among large nonresidential categories, highway and street construction was reported to slide 0.7% and manufacturing construction was down 3.3%. In contrast, power construction climbed 1.5%.

"Moreover, upsurge in investment in the infrastructure sector coupled with augmenting demand

PHOTOS: (LEFT) COURTESY OF CHEMQUEST GROUP INC.; (TOP) SUMITH NUNKHAM / GETTY IMAGES

for floor coatings from the chemical industry offers opportunities to the market players," Allied continues.

In the U.S. alone, a recent report from the National Association of State Budget Officers showed that while total state spending rose 7.3% overall in fiscal year 2022, infrastructure construction spending increased 15.3%, thanks to funding from the bipartisan infrastructure law. According to NASBO, this percentage is the highest annual figure since 1994, and is only expected to grow over the next several years.

However, Allied notes, organic solvents used in floor coating products, which can have impacts on the environment and human health, have hindered the growth of the global floor coatings market.

Of the floor structure segment, concrete reportedly dominates the global floor coatings market, with factors such as excellent durability, lower cost and tensile strength making it an extensively utilized material. This is followed by mortar, terrazzo, wood and others, respectively.

By region, Allied reports that the Asia-Pacific region makes up the largest growth of the floor coatings market, consisting of China, India, Japan, South Korea, Australia and the rest of Asia-Pacific. The demand for floor coatings has grown due to commercial and residential construction activities, as well as the construction industry in the region rising rapidly with augmented investment by the government.

Concrete reportedly dominates the global floor coatings market, with factors such as excellent durability, lower cost and tensile strength making it an extensively utilized material.



While the residential segment leads the floor coatings market due to the durability and longevity of floor coating, it is followed closely by commercial and industrial floor coatings. This is also reportedly due to maximum durability, easy cleaning and slip resistance.

Epoxy holds the highest share and is the fastest growing segment by binder type, according to the report. This is largely due to epoxy-based floor coatings being widely utilized in resurfacing applications and in covering stains. Epoxy growth is then followed by acrylic, polyurethane, methyl methacrylate and others, respectively, with growth anticipated in all binder types.

**Double-component coatings ... lead the coating component segment ahead of single- and triple-component coatings.**

Double-component coatings, which need to be mixed with an activator, hardener or catalyst, lead the coating component segment ahead of single- and triple-component coatings. This is reportedly attributed to substantial demand for anticorrosion products from multiple end-use sectors, with double component coatings offering superior durability, high corrosion resistance and resistance against chemicals such as inorganic and organic alkali petroleum products and acids.

However, the report notes, the COVID-19 pandemic has negatively affected the overall market and supply chain, with disruption, lockdowns and demand for raw materials negatively impacting production facilities globally. Construction projects are also facing lack of labor, lockdowns and economic slowdowns.

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## OUR COMPANY STORY

Abrasives Incorporated, producer of Black Magic® Coal Slag, has acquired the assets of Haller-Phillips Incorporated. Haller-Phillips has been a distributor of Black Magic® for several decades servicing New Mexico, Texas, and Oklahoma.

Abrasives Inc., based in North Dakota, with an office and warehouse in Minnesota, is widely known for manufacturing Black Magic® Coal Slag. It is used in the abrasive blasting, roofing and seal coat industries nationwide.

"With the purchase of Haller-Phillips in West Texas and New Mexico, we are able to combine resources to better serve customers in two of the largest oil fields in the U.S.," said Russell Raad, president of Abrasives Incorporated. He continued "We have knowledgeable field reps and a wide array of industry products. Those things, combined with our signature Black Magic®, gives us the ability to meet every need in the surface prep industry at a competitive price.

The acquisition of Haller-Phillips Inc. fits into Abrasives Inc.'s strategy to meet their customers' needs and their goal of supplying product "where they need it, when they need it."

"Many of our customers travel for their projects, and having operations in the Southwest will let us better meet their needs when they are doing work in that area. The acquisition is exciting for another reason, because Abrasives Inc., is an employee-owned company and the employees of Haller-Phillips will have the same opportunity to become owners within the new company," stated Raad.

Haller-Phillips Inc. has been in existence since 1962, successfully servicing the oil and gas industry. They have an office, store and processing operations in Hobbs, New Mexico; a store in Odessa, Texas; and a processing facility in Seagraves and Brady, Texas.




*Publisher's Note: An incorrect entry for Abrasives, Inc. ran in the November 2022 JPCL Blasting Resource Guide. The correct version appears above. We value the support of our sponsoring contributors and regret the error.*



COATINGS 101

# SURFACE PREP BASICS FOR CONCRETE

While many JPCL articles concern protecting steel structures from corrosion, coating professionals will assuredly encounter industrial structures composed of concrete that also require protection via coatings application. Because there are significant differences between steel and concrete substrates, the type of preparation and coating system selected for each will differ. Chiefly, concrete is a porous substrate, with countless tiny holes and nooks and crannies for moisture and other contaminants to seep into, as opposed to the relatively smooth surface of steel. It is also a more delicate substrate than steel and can be damaged by some of the mechanical methods the industry employs for surface prep.

This article, based on excerpts from a past JPCL article written by a concrete coating expert, provides a basic understanding for preparing concrete for coating application. It includes general advice for conducting condition assessments, a review of industry standards related to concrete surface prep, helpful guidance for selecting coatings and more.

Because there are significant differences between steel and concrete substrates, the type of preparation and coating system selected for each will differ.

*EDITOR'S NOTE: This section contains excerpts from the article, "An Overview of Preparing Concrete for Coatings: What to Ask, What to Do and Where to Find Help," written by Fred Goodwin of BASF Construction Chemicals. It was originally published in the May 2009 issue of JPCL and has been reviewed and amended for this article by JPCL staff.*

PHOTO: NORDRODEN / GETTY IMAGES

## The Big Picture

When it comes to thinking broadly about what surface preparation method to use, one should follow the steps outlined in the guideline from the International Concrete Repair Institute, ICRI No. 310.2 (formerly 03732). The document notes, for instance, that to determine the correct surface preparation, you must analyze the project and develop a preparation strategy by answering a number of questions, including those about the substrate conditions, coating requirements, owner requirements, application conditions, project objectives, the performance criteria and their price, and methods that will meet the performance criteria.

It is also helpful to think in detail about what surface preparation is before determining how it is best achieved on a particular project. SSPC-SP 13/NACE No. 6, "Surface Preparation of Concrete," is the industry standard for preparing concrete substrates. It was originally published in 1997, was reaffirmed in 2003 and every five years after that, and received a large-scale revision in 2018. The standard defines surface preparation as "[t]he method or combination of methods used to clean a concrete surface, remove loose and weak materials and contaminants from the surface, repair the surface, and roughen the surface to promote adhesion of a protective coating or lining system." SSPC-SP 13/NACE No. 6 further requires that an "acceptable prepared concrete surface should be free of contaminants, laitance, loosely adhering concrete and dust, and should provide a sound, uniform substrate suitable for the application of protective coating or lining systems."

While many of the recommendations herein apply to existing concrete substrates, the referenced standards also provide guidance for preparing new concrete prior to coating application.



PHOTO: SIMONKR / GETTY IMAGES

TABLE 1: **Typical Surface Properties of Finished Concrete**

| METHOD | PROFILE | POROSITY[A] | STRENGTH | PROBLEMS |
|---|---|---|---|---|
| Formed concrete | Smooth to medium | Low to medium | Medium | Voids, protrusions, release agents |
| Wood float | Medium | Medium | Medium | |
| Metal trowel | Smooth | Low | High | |
| Power trowel | Smooth | Very low | High | Very dense |
| Broom finish | Coarse to very coarse | Medium | Medium | |
| Sacking | Smooth | Low to medium | Low to high[B] | Weak layer if not properly cured |
| Stoning | Smooth to medium | Low to medium | Low to high[B] | Weak layer if not properly cured |
| Concrete block | Coarse to very coarse | Very high | Medium | Pinholes |
| Shotcrete[C] | Very coarse | Medium | Medium | Too rough for thin coatings |

(A) These surface properties are based on similar concrete mix, placement, and vibration and are prior to surface preparation.
(B) Strength depends on application and cure.
(C) Shotcrete may be refinished after placement, which would change the surface properties shown in this table.

## Condition Assessment

### What kind of concrete is involved?

What can you learn about its properties, such as its orientation, its age, its previous exposure, its finish and its quality? Proper surface prep provides options for improving those properties of the host concrete that facilitate accepting the specified material.

### How old is the concrete, and what does its age mean?

Concrete yet to be placed can be modified to reduce moisture issues, be textured for coating acceptance, or even become a decorative surface not requiring further preparation. Recently placed concrete has a relatively high rate of shrinkage (developing cracking and curling) and contains more moisture than older concrete. Applying cementitious toppings and overlays to freshly placed concrete can allow both materials to shrink at the same time. Old concrete can be rehabilitated for change of use, restored by recoating or repaired (thereby creating the issues of both old and new concrete on the same installation). But beware: old concrete can also be contaminated with oil, chlorides, carbonation or other unknown materials absorbed during previous service. Coating suppliers usually recommend removing existing curing compounds, form release agents, coatings and membranes (as well as contamination) because compatibility between different coatings and products and the actual concrete surface is generally not known and is difficult to

determine and ensure, especially when long-term service life is expected.

### What previous exposure does the concrete have?

Most deterioration mechanisms of concrete involve moisture, whether from internal mechanisms (e.g., alkali aggregate reactions, sulfate attack, and freezing and thawing damage) or from the migration of deleterious influences, such as chlorides and carbonation, that lead to reinforcement corrosion, staining (except from oil), leaching and efflorescence. Keeping water out of hardened concrete is a major reason for applying a protective system to concrete. Concrete exposed to differential temperatures (such as through an exterior wall or at the periphery of a cold storage unit) will develop a moisture profile, depending on the amount of moisture present and the temperature difference. When used for secondary containment, concrete will be subject to chemical exposures and will need chemical-resistant coatings.

### What kind of finish does the concrete have?

**Table 1** from SSPC-SP 13/NACE No. 6 describes typical concrete surfaces with respect to different types of concrete finishes.

### Is the concrete sound?

The SSPC-SP 13/NACE No. 6 standard also describes several simple qualitative tests to determine soundness of the concrete. These tests include:

- Lightly scratching a concrete surface with a screwdriver, file or pocketknife;
- Lightly striking the concrete with the edge of a hammer head; and
- Dragging a chain across horizontal concrete.

ICRI No. 210.3 (formerly 03739), which was just updated in 2022, and ASTM C1583 quantify the soundness of the concrete substrate using near-surface tensile strength measurements and should be used to supplement the simple tests above. The same tensile tests can also be used to perform adhesion for coating compatibility during application mockup and quality control for the applied system. SSPC-SP 13/NACE No. 6 includes a table that provides guidance on acceptable concrete surfaces for many coating applications following surface preparation; while the tests are helpful, the recommendations of





the coating manufacturer and good trade practice for the specific situation should always be followed.

## Surface Profile Requirements

**What are the requirements of the surface profile for the applied coating?**

The required profile will depend on the thickness of the material to be applied. ICRI No. 310.2 describes three thicknesses of material:

- Sealers (0–3 mils) [0–75 µ];
- Thin film coatings (4–10 mils) [100–250 µ]; and
- High build coatings, self leveling coatings, and polymer overlays (10 mils–1/4 inch) [250 µ–6mm].

The American Concrete Institute (ACI) defines a sealer as a liquid applied to the surface of hardened concrete to either prevent or decrease the penetration of liquid or gaseous media. A sealer is absorbed by the concrete, is colorless and leaves little or nothing visible on the surface. Sealers require surface preparation mainly to promote penetration into the concrete; any visible defects or profile will be unaffected. Depending on the chemical makeup of the sealer, different amounts of breathability (moisture vapor emission), darkening and protection are provided.

Generally, breathable sealers such as silanes and siloxanes will prevent the absorption of liquid water while allowing moisture vapor to escape without noticeably changing the appearance of the concrete. Some sealers, such as silicates and fluorosilicates, change the pH of the concrete and are reported to also densify and improve abrasion resistance of the concrete surface. Stains and dyes for concrete may also fall into the sealer category, depending on their drying film formation, unless the only purpose of the stain is to change the color of the concrete. Surface polishing has also recently gained popularity as an enhancement for concrete surfaces. Frequently, the polished concrete is stained and then sealed.

Thin-film coatings may be formulated to mask very minor defects and surface discolorations. Suitable surface preparation techniques for thin-film coatings depend on several factors. Patterns due to surface preparation and any but the smallest defects will likely become visible through the coating. If the amplitude of the surface profile is greater than the dry film thickness, a smooth coating surface is not possible. Some thin-film coatings on smooth horizontal surfaces can become very slippery when wet and generally require periodic recoating if subjected to wear from traffic. Thin-film coatings that are impermeable or otherwise sensitive to moisture tend to be problematic unless the concrete substrate is very dry.

Thicker coatings, such as self-leveling materials, polymer overlays, toppings and high-build coatings, have much in common with thin-film coatings regarding the relationship between surface profile and dry film thickness, moisture sensitivity, and wear; however, thicker coating layers can fill larger defects, create surface texture to yield slip-resistant surfaces; and provide longer service life than thin-film coatings.

## Surface Prep Methods

Low-pressure water cleaning (pressure washing <5,000 psi) and scrubbing with detergent do not remove sound concrete or change the concrete surface profile. Scrubbing with the use of surfactants and water velocity followed by vacuum removal of the cleaning solution produces a wet substrate and removes minor amounts of dirt, oil, grease, dust, friable, materials, debris, or other water-soluble contaminants. ASTM D4258 and D4259 and a guidance document from the Water Jet Technology Association (WJTA) are useful resources.

Erosion methods (i.e., grinding) can uniformly wear away the concrete surface with abrasive force from grinding media such as abrasive discs. This method leaves a dry dusty surface with very little profile. See ASTM D4259 for guidance on good practice of this technique.

Chemical reaction methods include acid etching and the use of

PHOTO: BREMECR / GETTY IMAGES

surface retarders for fresh concrete. Acid etching dissolves the cement paste (and limestone aggregate, if present), producing a very light profile on the concrete surface that has a relatively low pH unless neutralized. Acid etching does not work well on vertical surfaces or on concrete that has had a curing compound or sealer applied. ASTM D4260 provides guidance for acid etching and D4262 for surface neutralization following acid etching.

Surface retarders are used only for freshly placed concrete. The cement hydration adjacent to the layer of surface retarder is delayed, while the remaining concrete continues to harden normally. After sufficient strength has developed in the underlying concrete, the layer affected by the retarder can be removed by pressure washing and scrubbing, leaving an exposed aggregate wet surface suitable for placement of cementitious overlays and toppings. Guidance on surface retarders is usually supplied by the material producer.

Some methods of surface prep can cause "bruising," which occurs when a surface layer is weakened by interconnected microcracks in concrete substratese caused by use of impact, pulverization, and other mechanical methods for surface preparation. Be careful of bruising when using bush hammers, scabblers, scarifiers and rotomilling machines. Scarifiers and rotomilling (also known as surface planers or milling machines) use the chipping action of multi-tipped cutting wheels that rotate at high speeds to chip away at the concrete surface. Bush hammers and scabblers use serrated hammers with rows of pyramidal points and remove concrete by pounding the surface with piston-driven cutting heads placed at a right angle to the surface. The bruised layer typically extends to a depth of 1⁄8 to 3⁄8 in. (3 to 10 mm) and frequently results in lower bond strengths as compared to surfaces prepared with nonimpact methods.

**Unless the concrete surface is properly prepared, even the best sealer, coating, topping or overlay will not perform satisfactorily.**

Abrasive blasting, shotblasting and hydrodemolition are methods not only for surface preparation, but can also be used to remediate bruised concrete. Shot blasting, used to strip, clean and profile surfaces, produces a roughened texture that is dry and relatively dust free. Depending on the size of the steel shot, its speed, and machine design, the method can selectively remove softer and more brittle portions of the substrate. Hydrodemolition uses ultra-high-pressure waterjets to prepare the surface, producing a saturated, deeply profiled substrate. The hardness of the concrete, speed of hydrodemolition jet travel, impingement angle, and pressure of the water jet control the amount of removal.

Primers are sometimes used as a form of conditioning following surface preparation. Primers are used to improve the bond between the prepared surface and the coating material or to improve the surface for coating.

## Conclusion

Unless the concrete surface is properly prepared, even the best sealer, coating, topping, overlay or membrane will not perform satisfactorily. Trial applications that follow the manufacturer's instructions and good trade practices are the best means of achieving good system performance; they also provide acceptance criteria for proceeding with an installation. On any trial areas, bond testing, substrate cleanliness, substrate surface hardness, porosity and moisture condition evaluation should be performed to assure integrity of the substrate preparation effectiveness, coating adhesion and finished appearance. JPCL



PHOTO: DORALIN TUNAS / GETTY IMAGES

# NO DUST NO PROBLEM

## Saving Time and Money on Concrete Sludge Tank Rehab Project

BY JIM MARSTON, MARSTON INDUSTRIAL SERVICES



FIG. 1: Wastewater treatment facilities house not only sludge tanks, but also complex piping, ventilation, electrical conduit and access systems. Abrasive blasting using sponge media created very little ricochet, allowing the contractors to simply cover all equipment with reinforced poly.

When conducting rehabilitation work on concrete sludge tanks in a wastewater treatment plant, there are many many factors to consider including protecting the pipes, equipment, ventilation system and electrical conduit from damage during each stage of the rehab process. This can prove challenging, especially when adjacent tanks are in service during all phases of the work, even abrasive blasting.

One Fairfield, Maine-based coatings contracting crew encountered just such a challenge when they were tasked with the failed coating removal, surface preparation and recoating of three concrete sludge tanks for the Kennebunk Sewer District.

According to the scope of the project, there were three concrete sludge tanks that needed to be worked on, one at a time. All three tanks were located in the same area, and the tanks that weren't being worked on were to be kept in service with the building's ventilation system on the entire time. The contracting crews couldn't afford to create a lot of dust and overwhelm the ventilation system while abrasive blasting, and also needed to make sure that they didn't have any ricochet issues while they prepped and profiled the concrete tanks for the new coating system.

Ultimately, the four-man crew used a sponge media abrasive to remove the existing rubberized coating and create the proper profile for the application of a new coating system. This article will go through the steps of the project and highlight how these materials contributed to a successful completion.

## Project Background

With beaches, shopping, dining and charming historical districts, Kennebunk, and its neighboring town of Kennebunkport, are two of Maine's most popular tourist destinations. Kennebunk has a population of approximately 11,500, and the Kennebunk Sewer District meets the sanitary sewer needs of all residents

PHOTO: COURTESY OF THE AUTHOR

and visitors to the town. The wastewater collection system encompasses more than 40 miles of sewers and 28 pumping stations. Wastewater is received and treated at a secondary treatment facility that treats 1.31 million gallons per day (mgd). This secondary treatment facility is where the three below-grade concrete sludge tanks are located. Each tank is 2,000 square feet in area, and all three were in need of rehabilitation.

A condition assessment found that the existing thick, rubberized coating was failing and delaminating in many areas throughout the tanks' interiors. The crew was tasked with removing the existing coating without damaging the concrete underneath. The last thing they wanted to do was create more issues by damaging the substrate and then having to repair those damaged areas, especially since they needed to stay on schedule and within budget.

Given the various constraints of the job, traditional abrasive blasting did not seem to be the right choice for removing the existing coating and meeting the surface profile specifications. The crew turned to a sponge media abrasive that includes within it 60-grit aluminum oxide, an option that would create little to no dust and would create the proper surface profile without damaging the interior of the concrete tanks.

## Keeping Dust, Rebound and Waste to a Minimum

The crew got to work on the first tank, manually chiseling and grinding parts of the first layer to remove excessively thick spots left from the existing protective coating system. They were then ready to begin abrasive blasting of the first tank, and they were to do this while the other two adjacent sludge tanks were completely in service and the ventilation system in the building was still online.

Ordinary abrasive blasting would have created a great deal of dust, forcing the crew to reroute the air supply in order to protect the process equipment and control room next door. However, because the sponge



FIG. 2: **The Kennebunk Sewer District meets the sanitary sewer needs of all residents and visitors to the town. Wastewater is received and treated at a secondary treatment facility that houses the three below grade concrete sludge tanks.**



FIG. 3: **Each sludge tank is 2,000 square feet in area, and all three were in need of rehabilitation. The crew worked on one tank at a time, completing all coating removal, abrasive blasting and coating application before returning it to service and starting on the next tank. The two tanks not being worked on remained fully operational.**



FIG. 4: **The existing coating in tanks was a thick, rubberized coating that was failing and delaminating in many areas. The challenge for the crew was completely removing the failed coating and not damaging the concrete substrate underneath.**

PHOTOS: COURTESY OF THE AUTHOR



FIG. 5: **Once the sponge media abrasive blasting was completed, the crew blew down and vacuumed the tank's interior to rid the surface of any debris. This was the final step prior to the coating application.**



FIG. 6: **Only 17 30-pound bags of the sponge media were used per tank. With conventional abrasives, the disposal process would have been time-consuming and expensive, especially considering the tanks are 15 feet below grade.**



FIG. 7: **The coating system consisted of an epoxy primer coat and polyamide epoxy topcoat, applied using airless, plural-component spray equipment.**

media blasting suppresses dust, all the crew had to do was put up a poly curtain between the tanks; no other containment was necessary. In fact, the Kennebunk Sewer District operators were able to get in and out of the area to monitor the working concrete sludge tanks throughout the entire duration of the job without impacting either the functionality of the tanks or the sponge abrasive blasting process.

Because the abrasive blasting created so little dust, the crew was able to keep on schedule without having to go back and "touch up" areas that they missed on the first pass. According to the crew's foreman, there was at least 75% less dust on the jobsite than there would have been if traditional blasting was performed. With an average removal rate of 360 square feet per hour (34 square meters per hour), the crew was able to move quickly through the tank, while not sacrificing quality or surface profile.

Creating the proper profile on the concrete was a top priority for this job, but so was keeping the concrete substrate in good condition with no damage occurring from the blasting process. The sponge media was able to create the specified profile of ICRI CSP 3 without damaging the concrete. This meant that no additional concrete filling or repair was needed prior to the application of the new coating system. It should be noted, however, that the concrete did have some pre-existing cracks prior to the abrasive blasting process. The crew used a two-component, 100%-solids epoxy compound to repair these cracks. This epoxy patching and surfacing compound is specially formulated for use in the water and wastewater industry.

The sponge abrasive also created very little ricochet during the blast process. With traditional abrasive blasting, the crew would have had to wrap all the surrounding piping and equipment in rubber to protect them from the ricochet. Instead, they just had to cover the piping with reinforced poly. This was a much easier and a less labor-intensive process for the crew.

In addition, the crew saved time and money as far as blast media waste was concerned. Unlike conventional, single-use

PHOTOS: COURTESY OF THE AUTHOR

abrasive media, the sponge media used on this project is recyclable. The crew originally looked into using a different type of non-toxic media, but quickly realized that that single-use abrasive would create cleanup issues. If they had gone with the original plan to blast with ordinary abrasives, they would have used 8,000 pounds for each of the 2,000-square-foot concrete tanks, compared to only 17 30-pound bags of sponge media per tank. With ordinary abrasives, the crew would have needed to bring in vacuum trucks, and the disposal process would have been more time-consuming and costly, especially considering the tanks are 15-feet below grade. With the recyclability of the blast media, cleanup was relatively easy and not labor intensive.

## A New Protective Coating System

Once the old coating system was completely removed from the interior of the tank, the concrete was properly profiled and all debris was removed, the crew was ready to begin applying the new protective coating system. They started with a primer coat of a polyamide epoxy mastic at a thickness of 6-8 mils using airless spray equipment. This fast-cure mastic is a high-solids, high-build epoxy designed to protect concrete in industrial exposures, such as wastewater treatment facilities.

For the topcoat, the team installed a two-component, 100% solids, elastomeric, aromatic polyurethane. For this coating application, the crew members used a plural-component spray unit to lay down 100-125 mils over three passes.

In the sumps of the tanks, the existing coating didn't need to be completely removed as it was in good condition. For these areas, the team applied a bonding agent before applying the epoxy primer coat. The bonding agent used was an organo-silane compound dispersed in isopropyl alcohol that improves adhesion of coatings to a variety of substrates, including existing protective coatings that are past the recoat window.

## Safety Measures and a Ventilation Win

Throughout the entire coating application, the crew members wore protective suits, respirators and gloves. During the blasting process, the workers always wore blast hoods, blast suits and hearing protection. In addition, the crew constantly monitored the air in the confined space of the tank using a four-gas detection gage, and fresh air was pumped down into the tanks.

According to the foreman, it was a game changer for crew to be able to use the treatment plant's ventilation system, from both a safety and cost perspective. Since so little dust was created during the blast process, they were able to use the facility's ventilation system without any issues. If this hadn't been the case, they would have had to bring dehumidifiers, dust collectors, heaters and other large equipment on the jobsite. This would have cost the Kennebunk Sewer District a considerable amount of money and would have been a much more difficult setup for the crew.

**75%**
**LESS DUST AND AN AVERAGE REMOVAL RATE OF**
**360 SQUARE FEET PER HOUR HELPED KEEP THE JOB ON SCHEDULE.**



FIG. 8: With all three tanks completed, the Kennebunk Sewer District wastewater treatment facility is back up and running at full capacity.

PHOTO: COURTESY OF THE AUTHOR



FIG. 9: **The job was completed over a two-month timeframe, with each tank taking an equal number of days. The new protective coating system provides a long-term solution for the three sludge tanks.**

## On Schedule and On Budget

From start to finish, the rehabilitation of all three tanks took two months, with each tank requiring an equal amount of time. The coating removal and abrasive blasting process took about seven to eight days per tank, and the coating application took the crew about four days per tank. As far as sequencing goes, the crew would drain one tank, remove the failing coating, prep and profile the surface, apply the new coating system, put the tank back into service and then start with the next one.

Along with the crew's hard work, abrasive blasting with sponge media instead of a traditional media set the project up for success from the start. The time saved on the setup and cleanup of the abrasive blasting portion of the job saved the Kennebunk Sewer District a considerable amount of money. Because abrasive sponge blasting didn't damage the concrete, the crew didn't have to spend any time, money or resources on concrete repair after the blast. In addition, because the media is recyclable and yields a minimal amount of waste, this project also came out ahead as far as an environmental impact is concerned.

Overall, the focus of the four-man team, as well the abrasive selection and high-quality coating materials, led to the success of the job. The crew was able to keep two of the sludge tanks in service while they worked, minimizing downtime – a win for everyone involved, including the contracting company and the Kennebunk Sewer District. JPCL

### ABOUT THE AUTHOR

**Jim Marston** is the President of Marston Industrial Services, a coatings contracting company that has provided water and wastewater facility rehabilitation services in many municipalities throughout Maine and New Hampshire. He has more than 42 years of experience in the protective coatings industry.

PHOTO: COURTESY OF THE AUTHOR



# LARGEST US MURAL COMPLETED IN OHIO

BY DESTINY JOHNSON & HALEY CARNAHAN, JPCL

A collective of artists has recently completed what is now considered to be the largest mural in the United States. Located at the ADM grain silo facility along the East bank of the Maumee River in Toledo, Ohio, the Glass City River Wall (GCRW) spans the front of all 28 silos – totaling 170,000 square feet.

Spearheaded by local non-profit Urban Sight, Inc., the organization raised more than $1.2 million in funding from a combination of over 800 public and corporate donors to produce the mural. These allotted funds were used for project preparations, production, and communication, and will also aid any future maintenance needs.

Locals and those involved with the project shared with JPCL that the final art piece is easily visible from Interstate 75 (which sees more than 80,000 vehicles on average in the area per day) and downtown Toledo.

"Together, we have made history with the largest mural in the country, underscoring Toledo's reputation as a community dedicated to the arts, and igniting conversations around hope, positivity and inclusion that will carry us forward into the future," said Toledo Mayor Wade Kapszukiewicz.

## An Idea is Born

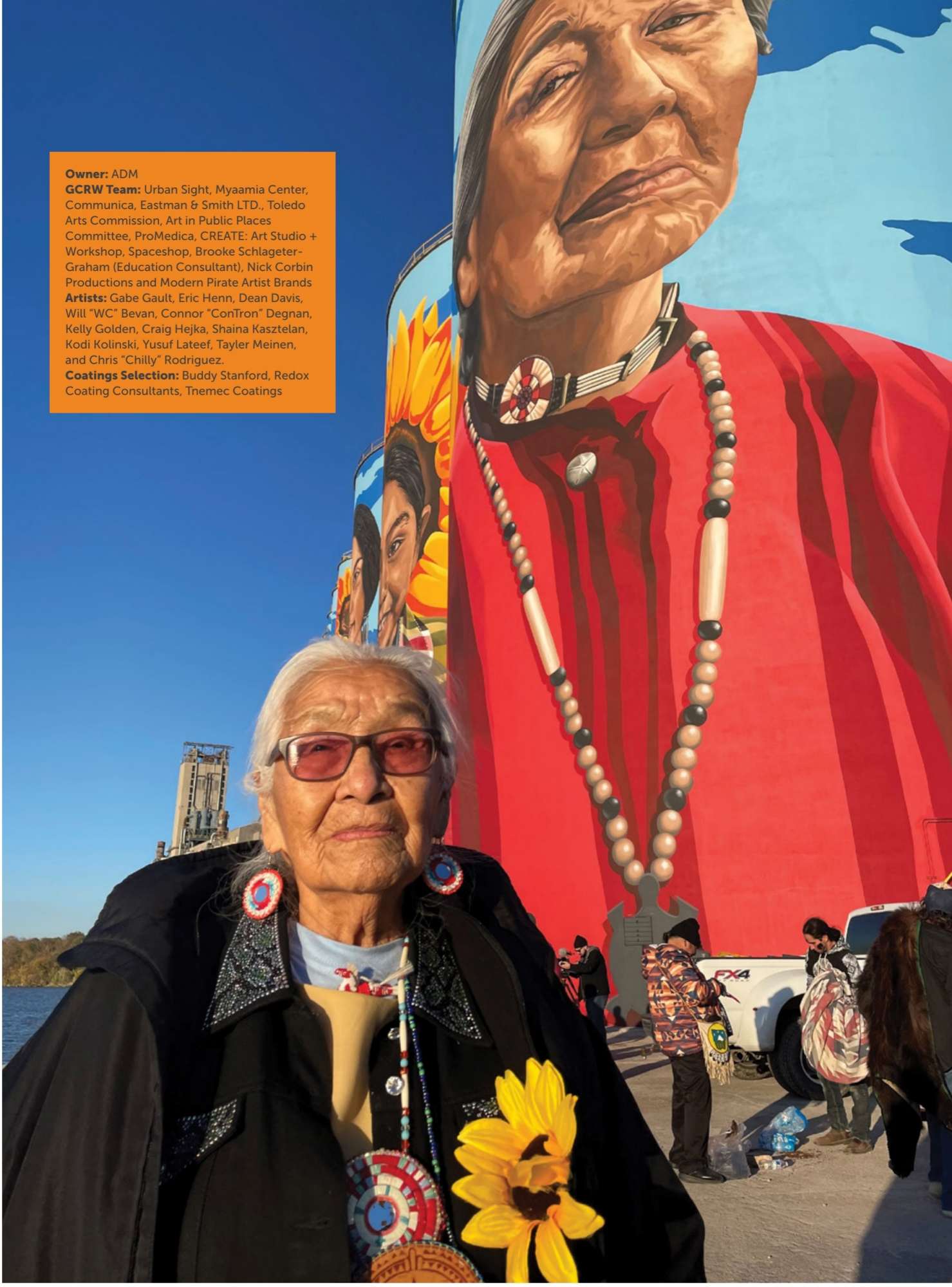
Back in July 2019, a group of friends was floating down the Maumee River pondering how more welcoming artwork could be brought into the Toledo community as a monumental gateway for residents and visitors. Ideally, the crew wanted to create something that was both warm and welcoming, but that also represented hope and positivity.

Of the group of friends, Nicole LeBoutillier, Co-Founder at Urban Sight, Inc. and Operations Manager for GCRW, suggested several sites that would potentially work for a multi-phased artistic mural installation. One of the sites – and the most massive – was the ADM grain silo facility.

"We just said, let's go for it – go big or go home," said LeBoutillier. Shortly after this moment on the river, LeBoutillier reached out to Christina Kasper, who would become the President of Urban Sight and the Project Manager for the GCRW project.



PHOTO: COURTESY OF NICK CORBIN PRODUCTIONS



**Owner:** ADM
**GCRW Team:** Urban Sight, Myaamia Center, Communica, Eastman & Smith LTD., Toledo Arts Commission, Art in Public Places Committee, ProMedica, CREATE: Art Studio + Workshop, Spaceshop, Brooke Schlageter-Graham (Education Consultant), Nick Corbin Productions and Modern Pirate Artist Brands
**Artists:** Gabe Gault, Eric Henn, Dean Davis, Will "WC" Bevan, Connor "ConTron" Degnan, Kelly Golden, Craig Hejka, Shaina Kasztelan, Kodi Kolinski, Yusuf Lateef, Tayler Meinen, and Chris "Chilly" Rodriguez.
**Coatings Selection:** Buddy Stanford, Redox Coating Consultants, Tnemec Coatings

PHOTO: COURTESY OF ERIC HENN MURALS



Together, the duo would put a steering team together and bring in Valerie Thompson from the mission-based, not-for-profit integrated healthcare organization ProMedica, among others from a collection of organizations including Communica, ADM, Eastman & Smith LTD., the Toledo Arts Commission, Art in Public Spaces Committee, CREATE: Art Studio + Workshop, Spaceship, Nick Corbin Productions, Modern Pirate Artist Brands and educational consultants.

Once ADM was on board for the project, Urban Sight then partnered with the Toledo Community Foundation to store and account for project funding. The team also applied for its 501 C3 credentials, which were finalized in April 2020, along with the official formalization of the Glass City River Wall Board.

After clearing some red tape and winning approval for the mural project, the team put together a Request for Qualifications. LeBoutillier shared that during this process the team already had ideas about what the mural would represent, having been fueled by the area's Native American histories. In one of the group's first meetings where the qualifications request was defined, ADM Facilities Manager Jason Boyer and members of the Arts Commission discovered a historical marker stating where Native Americans had fortified prior to 1655.

This knowledge, paired with the city's own description, was the basis for the RFQ. With the help of the Arts Commission, the RFQ was sent out on an international level. As a result, the team received submissions from artists across the nation to as far as Australia.

## Design Creation

After combing through the submissions, the team decided on a design created by

PHOTO: COURTESY OF ERIC HENN MURALS

Southern California native Gabe Gault. His artistic style is described as a combination of classical painting techniques with modern subjects and has a particular focus on individuals dedicated to making a positive difference in cultural settings.

"I want to tell a story that is colorful, bold, simple and readable," Gault said in his application. "My objective is to offer both an origin story, which honors the original farmers of the region, as well as an inspirational image for the future: a cornucopia of abundance and prosperity which speaks to ADM's corporate governance and philanthropic contributions."

In previous projects, Gault's work has been noted to feature backgrounds with juxtaposing urban camouflage patterns and classic flora as storytelling devices. The reason behind the decision to pick Gault's artwork, LeBoutillier shared, was that Gault's design was the only one to include Native American histories.

In his initial rendering of the GCRW, in addition to the Native American portraits, Gault was hoping to incorporate more farm-like landscapes with insects and an array of flora and fauna. These, of course, were later nixed for a striking blue background and varying sizes and styles of sunflowers so that both the portraits and flora could be more easily viewed from a distance.

Before approving the design, the team formally engaged with the Native American community to ensure the correct portrayal of the culture, as the portraits were created to represent the original agriculturalists from the region. Specifically, the Native American women and children who played a significant role in planting and maintaining the vast corn fields that historically lined the banks of the Maumee River from Toledo to Fort Wayne, Indiana.

These decisions were made with help from Daryl Baldwin (Kinwalaniihsia), a citizen of the Miami Tribe of Oklahoma and Founder and Executive Director of the Myaamia Center. Because the act of placing Native Americans on a grain silo was practically the equivalent of putting African Americans on a cotton gin, Baldwin stepped in to help the team ensure the right message – the Native American message – was conveyed correctly.

In a conversation with Kasper, Baldwin pointed out how Native Americans tend to be viewed as people of the past, with feathers on a battlefield. However, the fact remains that Native Americans are a people of the country's past, present and future.

In referencing the groups Indigenous to the lower Great Lakes, the finalized portraits depict a grandmother, mother and child from the Miami Tribe of Oklahoma, the Shawnee Tribe and the Dakota Tribe, respectfully. Living models were chosen from the existing tribes to reinforce the fact that Native Americans are not a people from the past but exist in vibrant communities today.

To achieve this message, the models are depicted as wearing jewelry common to these people both in the past and present, in addition to a mix of modern-day clothing that demonstrates that these people represent living communities, each with connections to their community's history and ancestors.



PHOTO: COURTESY OF NICK CORBIN PRODUCTIONS

> "I want to tell a story that is colorful, bold, simple ... My objective is to offer both an origin story, which honors the original farmers of the region, as well as an inspirational image for the future."
>
> — *Gabe Gault*



The GCRW team has shared on its website that all are deeply grateful to its Native American collaborators, and the Myaamia Center at Miami University in Oxford, Ohio, for their wisdom, input and support.

## Artists Get to Work

Once a final design was approved, a corporate fundraising campaign was launched in August 2020. In addition to receiving funds from private and corporate sponsors, the project also saw funds from residents and donors all over the nation.

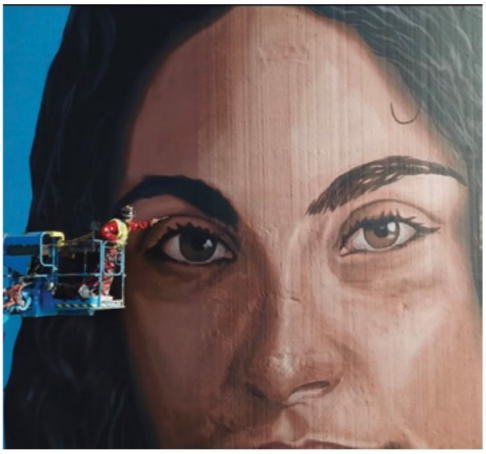
Upon receiving a grant from the Ohio Arts Council, the team was put in touch with lead muralist, Eric Henn, who is known for completing murals on cylindrical surfaces, most notably water tanks. Gault, Henn, crew chief Dean Davis and a group of local artists were able to come together and bring the artwork to life at ADM. This included local artists Will "WC" Bevan; Connor "ConTron" Degnan; Kelly Golden; Craig Hejka; Shaina Kasztelan; Kodi Kolinski; Yusuf Lateef; Tayler Meinen; and Chris "Chilly" Rodriguez.

As noted by overseers of the project, coatings work on the silos followed closely behind ADM's scheduled maintenance work, which takes place every five to seven years. Detroit Sign Company assisted with logistics and equipment vendors for the project, however, most crew members reverted to hand and power tool cleaning for any remaining dirt and grime on the surface of the silos.

Thanks to the help of Nick Corbin, the artists were able to develop a system capable of taking photos of the silos and translating them via the doodle grid to properly place the sunflower and portrait designs.

Corbin, who has also been shooting a full-length documentary since June 2021 about the GRCW, had never used drones prior to the project.

"The drone we used for the entire project was a DJI Mavic Air 2. It's a fairly decent consumer-level drone," he explained. "We needed aerial photos, so I learned how to



PHOTOS: (TOP) COURTESY OF NICK CORBIN PRODUCTIONS; (BOTTOM) COURTESY OF ERIC HENN MURALS

"From all my years of working, I knew that you need something that's going to cover in one coat or else you're going to be here forever ... The material is just as important as the artwork, if not more."

*— Eric Henn*

use it. That's the only equipment we used for those types of photos and videos."

"Once we projected it up there, we were able to really get moving on the mural itself," Davis said. "We had an artist from Toledo that came to the plate, and he came up with the idea of working it together with this reference point gridding system called doodle gridding. Honestly, it was probably the most successful way to get those flowers drawn up there and put in size-wise to make it work."

Coatings for the project were primarily selected by Henn, with the help of Buddy Stanford and the entire team at Redox Coating Consultants. Trent McNutt, coating consultant and local resident of the Toledo area, provided onsite support throughout the project, while Randall Cooper worked directly with Henn during the material selection process.

Consisting of just two different products, coatings applicators utilized a flexible, breathable acrylate coating designed for concrete and a versatile and durable water-based acrylic coating. Both coatings, which were used in conjunction with one another, were selected for the availability of a wide variety of colors and easy application properties.

In an interview with Stanford, it was shared that the coatings selected for the massive project have excellent elastomeric protection against driving rain, alternate freezing-thawing and UV light. Each coating also has a matte finish.

"Just from all my years of working, I knew that you need something that's going to cover in one coat or else you're going to be here forever and you're going to have double the volume of material that you have to do," Henn said regarding the coating selection.

"It's made for concrete, it covers well, I've used it on many projects, and the colors are vibrant. Everything could have been two or three coats, and you're talking doubling or tripling the time of what it already took. The material is just as important as the artwork, if not more."

Prior to starting on detail work, a team took several months to cover the silos with the bright blue base coat. Afterward, the crew moved on to applying the sunflowers, while Henn focused on sketching and painting the detailed portrait work.

"We tried to execute it in a timely fashion and the game plan that we came up with, I think the initial coating itself and getting down the basecoat we missed it by four days which was a remarkable feat," Davis said.

During the painting process, Henn would premix colors ahead of time to easily move from one silo to the next. He explained that when working on the portraits he had to start by mixing up 80 gallons of skin tones, with 15 gallons for each tone used. Afterward, he moved on to the hair, eyes and clothing.



While Henn worked on the portraits, Davis and the team of local artists continued work on the flowers and some of the "camo" – or the base blue tone used across the silos. Design changes were made throughout the project on the portraits, particularly regarding the clothing design or colors, which Henn explained helped with contrast.

PHOTO: COURTESY OF ERIC HENN MURALS



"People are excited and quite proud that the largest mural in the U.S. is here in Toledo ... As a whole, I think the thing that made the project come together was the city of Toledo."

— *Nick Corbin, Dean Davis*

"A lot of murals, they develop as you go. You start out with a concept and sometimes you do it dead-on and keep the concept, but then a lot of times you can make it better onsite," said Henn.

However, Henn noted that the biggest challenge while painting the portraits was the weather, including being right on the water, cold temperatures and the tip of the silos acting like a wind tunnel.

"It's about four days out of a five-day week that these winds are 20-25 miles per hour at this very end silo, so you're always dealing with that wind," he said. "You're up in a 135-foot lift and you're swaying, then your paint is splattering. When you're tucked in down the line in the silos, you get lost in the wind."

On the flip side, Henn's favorite part of working on the project included being up in the air and only feet away from the Maumee River to enjoy the wildlife. Henn saw a few bald eagles every day while working, people came by in boats to beep and wave, and added it's "really soothing to work on the water."

Since completing the massive project, Corbin said that the community has responded very positively; however, East Toledo has expressed interest in having the back of the mural painted since no one on that side of town can see it from the road.

"People are excited and quite proud that the largest mural in the U.S. is here in Toledo," he added.

In relishing a job well done, Davis added, "As a whole, I think the thing that made the project come together was the city of Toledo," adding that artists involved with the project really brought their "A-game."

## Beyond the Silos

While the GCRW was being completed, the teams involved with the project were simultaneously developing a series of relationships with the members of the Toledo community and creating an educational component that could better connect the community to the project.

The outcome: A collection of educational and community outreach resources aimed at expanding beyond the artistic installation to promote creativity, cultural understanding and emphasize the power of storytelling through the universal language of art.

The curriculum provided through the GCRW includes K-12 visual arts, ELA and social studies options, with additional opportunities to participate in activities and hands-on projects. Non-students in Toledo are also invited to get involved by utilizing the education community pages, which offer information about local events,

PHOTO: COURTESY OF NICK CORBIN PRODUCTIONS

and other educational resources with links to local museums, research and other components to better understand the mural and its purpose. Of the resources available, there is also a 30-minute documentary on the educational microsite that describes the project from concept to finish.

One of the more notable educational events, according to Kasper, took place before the mural was complete and involved an exhibit at the city's Imagination Station. During this community collaboration, individuals were invited to paint 8x8 squares to create a mural that would tell their own story, or Toledo's story.

In total, there were more than 800 submissions for the separate mural project.

"I don't know what made it real," said Kasper. "I think when we started to get feedback, particularly from children and parents. I think those moments where you could see a shift. Those were the moments that really made me really, still. And super inspired."

Kasper concluded by sharing how cool it was to see kids grow and learn from the educational experiences and the impact the mural had had on them. Many of which she'd heard stories from their parents and older siblings asking to be driven past the mural to get a glimpse.

"It's like when you're doing a project, looking at the finished project and not knowing what goes into it and how many people are involved and the issues – you just don't have a clue," Henn said. "We had paint shortages throughout last year, we had COVID, and stuff like that. It all had its hiccups, but I guess it's always like a big heavy burden until the project's done. Then it's like something's been lifted off your chest."

When asked how this project differed from other ones he completed, other than the scale, Henn said, "Besides this being my home state and great for me, I feel honored to do a mural with indigenous people of the area and they're all here, it's not like Native Americans are in the past. It's an honor to do that and be involved. I have some Native American in my family genes and so that makes it very special."

The supporting educational materials from GCRW are all accessible and interactive, with multi-disciplinary properties that inspire the exploration and celebration of Toledo's history, in addition to recognizing the value of telling our own stories. JPCL



PHOTO: COURTESY OF ERIC HENN MURALS

# NEWS FROM THE TRACKER

BY KONSTANTINE FEKOS, PAINT BIDTRACKER

## CONTRACT AWARDS

The **Wisconsin Department of Transportation** has awarded a $5,029,020 contract to Euro Paint, LLC, of Lowellville, Ohio, for painting and repairs to the Leo Frigo Memorial Bridge, which carries Route 43 over the Fox River in Green Bay, Wisconsin.

The bridge, formerly known as the Tower Drive Bridge, originally opened in 1981 and is the highest bridge in the Green Bay area. The city reportedly renamed the bridge in 2002 to memorialize a local philanthropist and civic leader.

The project involves cleaning, priming and overcoating the tied-arch bridge structure. The contract includes a lump sum item for structural cleaning with a recycled abrasive and repainting. Steel surfaces will receive a coating system of an epoxy or zinc-rich primer, an epoxy intermediate and a polyurethane finish. The contract also



involves removal and replacement of 2,970 linear feet of electrical wire lighting, roadway finishing, and installation of electrical and lighting systems.

Surfaces will require preparation in accordance with standards for Hand Tool Cleaning (SSPC-SP 2), Power Tool Cleaning (SSPC-SP 3) and Bare Metal Power Tool Cleaning (SSPC-SP 11). Negative pressure containment and collection of waste materials is required, as well as certifications for SSPC-QP 1 and QP 2. The contract has a completion date of Sept. 15, 2023. Owner-approved manufacturers include Carboline, International Paint, PPG, Rust-Oleum and Sherwin-Williams.

Bidding for the project had opened earlier this year in August; Euro Paint was the lowest of four apparent bidders. Additional bids included Civil Coatings and Construction Inc. of Valparaiso, Indiana, in the amount of $5,639,185.30; Liberty Maintenance Inc. of Youngstown, Ohio, in the amount of $6,329,000; and Southern Road & Bridge LLC of Tarpon Springs, Florida, in the amount of $6,688,532.

The **Pennsylvania Department of Transportation** has awarded a $1,578,587 contract for painting and rehabilitation of the State Route 4034 bridge over I-99 in Imler, Pennsylvania.

The contract was awarded to Swank Construction Co. of New Kensington, Pennsylvania.

The project involves cleaning and painting structural steel surfaces, removing existing deck joints at abutments, adding new expansion dams and placing latex-modified concrete overlay over the entire deck. The contractor will oversee repairing spalled, delaminated and hollow areas of concrete on the specified far abutment.

The project includes one lump sum item for painting existing structural steel, and approximately 1,500 square yards of concrete overlay and protective coating. This contract also includes structure work on State Route 1004 that carries traffic over Cove Creek in Snake Spring Township, including placing grout between existing precast elements, performing stabilization of existing approach slab and installing structure foundation drains.

Surfaces must be cleaned and prepared in accordance with standards for high-pressure waterjetting and Near-White Metal Blast Cleaning (SSPC-SP 10/NACE No. 2). Containment according to SSPC-Guide 6, waste disposal according to Guide 7, and certifications for SSPC-QP 1, QP 2 and QP 3 are required. Concrete surfaces will require a coating system of epoxy resin and latex-modified overlay. Structural steel will receive a coating system consisting of organic zinc, epoxy and urethane. Owner-approved manufacturers include Carboline, Corro Therm, International Paint, PPG, Sherwin-Williams and Wasser.

Swank Construction was the lowest of three apparent bidders. Additional bids included HRI, Inc. of State College, Pennsylvania, in the amount of $1,590,997; and Cottle's Asphalt Maintenance, Inc. of Everett, Pennsylvania, in the amount of $1,644,152.70.

PHOTO: JAMESBREY/ GETTY IMAGES