



HRCSA is the only one-coat system that held up well against traditional zinc-based three-coat systems in an FHWA study. The International Bridge Administration has been putting HRCSA to the test.



One Bold Paint A Look at HRCSA One-coat System

Victoria Kaplewski, Technical Writer
Center for Technology & Training

Photo: Shutterstock

Inside



New Facilities, New Spaces, Unhindered Service
► Page 3



Serving Michigan's Local Road-owning Agencies: The CTT's Newest Staff
► Page 7



Technology "Woven" Into Asphalt: A Follow-up on a Michigan Fiber-reinforced Asphalt Paving Project
► Page 9

Also Inside:

Photo Contest! ► Page 2

Great Ideas Challenge ► Page 14

Motor Grader Training ► Page 15

Back Page

Upcoming Events

Engineering Tech Assist



The International Bridge Administration (IBA) team made a bold move with the paint system they chose for repainting portions of the International Bridge between Sault Sainte Marie's Michigan and Ontario sides. And, it's not the paint's color that's attracting attention: while widespread practice is to paint steel structures with a three-coat system, the paint being used on the International Bridge is a one-coat system.

The decision to use a one-coat system is, in fact, supported by research. In 2011, the U.S. Federal Highway Administration (FHWA) evaluated the performance of eight one-coat systems against a three-coat and a two-coat system in an accelerated laboratory test and outdoor exposure conditions.¹ They found the best performing system—based on rust creepage, coating defects, color reduction, gloss reduction, and adhesion strength—to be the three-coat zinc-epoxy-polyurethane system closely followed by the HRCSA one-coat system, which ceded to the three-coat system because it didn't retain color and gloss as well.¹

HRCSA, or high-ratio calcium sulfonate alkyd, is an alkaline one-coat system that "neutralize(s) acidity by promoting passivity at the steel surface", effectively resisting corrosion, repelling water, and bonding strongly with ions in metal substrates.¹ As such, HRCSA performed well in both the laboratory test and the outdoor settings. A noted drawback is HRCSA's "tenderness for a significant amount of time after application".¹ In spite of that "limitation", the FHWA study concluded that HRCSA "presents an interesting

alternative for maintenance applications on existing structures".¹

From Test Sections to Whole Project

It was an alternative that the IBA was willing to consider in 2016 when bids to repaint the Canadian arch alone with a three-coat zinc-base paint system came in at \$6 million—double the engineer's \$3 million estimate.

"We decided to investigate HRCSA," shared Karl Hansen, bridge engineer for the IBA, who travelled to Toronto to see actual applications of that particular one-coat system. There, he saw "evidence" of HRCSA paint stopping the reaction that causes rust to form. "We peeled off a couple pieces of that paint on a train bridge, and what was underneath was back to white metal, and the pack rust had stopped in its tracks, no pun intended," he said.

Part of the IBA team's investigation involved applying HRCSA to the floor girders of the first two spans, located on the bridge's south—or US—end, of 63 total spans. While it was estimated at \$250,000 for contracted work, the IBA ran the test for \$130,000 in-house, which included all wages, benefits, materials, and equipment (notably including the purchase of a \$40,000 pressure washer that would also be used in later projects).

The IBA put the Canadian arch project back out for bids in 2017, this time using HRCSA as a specification, and completed the repainting that same year using HRCSA within budget. "At the two-year warranty, it passed with flying colors," said Hansen.

► continued on page 4

Letter from the Editor

Albert Einstein is often attributed as saying, “Insanity is doing the same thing, over and over again, but expecting different results.” Yes, how crazy is it to keep doing something the same way and expecting results to change and improve! From Einstein’s wisdom, we can deduce that it is really *sanity* when we *do some thing in a divergent way to get different results*. By rethinking and improving a way of doing some thing, we can expect different results, maybe even better results.

This issue brings to you the stories of various agencies that have demonstrated this kind of sanity, that have dared to do some thing in a divergent—sometimes apparently counter-intuitive—way. These agencies spent valuable resources on the innovative rather than the ‘same old things’ and, because of that decision to pursue something different, they have been realizing positive results. Within these pages, we look at the International Bridge Administration’s (IBA) decision to paint the International Bridge in Sault Ste. Marie with a one-coat system rather than a standard three-coat zinc-based system as a way to improve their asset management processes. In these pages, we share the stories of Emmet County Road Commission (CRC), Houghton CRC, Kent CRC, and the Road Commission for Kalamazoo County who all decided to build new facilities—in some cases, on a bigger acreage—as a way to improve their level of service to residents and workplace satisfaction for employees. And, herein, we revisit Dickinson CRC’s decision to use fiber-reinforced asphalt on a Dickinson county road paving project in 2018 as a way to improve the road’s performance and service life. By handling their maintenance strategies and their facilities and spaces in a different way, these agencies are finding they now have well-maintained assets on a limited budget, a better level of service for the motoring public, and better employee satisfaction.

Also in this issue, we introduce you to two new Center for Technology & Training employees: Ingrid Sandberg, a research engineer, and Tammy Hodson, a business and training support specialist.

In the meantime, please share suggestions for newsletter articles or training topics with us by e-mail ing us at ctt@mtu.edu, by completing the Topic Suggestions form at <http://michiganltap.org/The-Bridge>, or by completing the Present tab form on our online conference pages. We value your feedback!

Victoria

Photo: CTT archive



PHOTO CONTEST!

CATEGORIES

Summer road maintenance
(pavement repairs, mowing, grading, dust control, tree cutting, safety)

Winter road maintenance
(plowing, deicing, anti-icing, cutting banks, removing snow)

Bridges & culverts
(inspection, repairs, maintenance)

People
(work crews, community outreach, public events, school events, training)

Equipment
(new or historic equipment, innovations, equipment for a cause)



DEADLINE: December 31st

Photos judged on:
- fit for the category
- general composition
- aesthetic appeal (e.g., perspective, lighting)

Submitted photos should follow safety requirements for the depiction and should be clear and high resolution

PRIZES

Per Category: Free CTT webinar of your choice

Grand Prize: Free one-day conference registration of your choice

SUBMIT ENTRIES at
michiganltap.org/2023photocontest

Connect With Us!

Find the Center for Technology & Training on...



Facebook:
facebook.com/ctt.mtu



Instagram:
https://www.instagram.com/ctt_mtu/



LinkedIn:
<https://www.linkedin.com/company/center-for-technology-and-training/>



New Facilities, New Spaces, Unhindered Service

Victoria Kaplewski, *Technical Writer*
Center for Technology & Training

Emmet County Road Commission (CRC). Houghton CRC. Kent CRC. Road Commission for Kalamazoo County. Each of these local road-owning agencies has undertaken a challenging task in the past seven years: each has opted to invest in new facilities in the midst of balancing needed road and bridge maintenance or improvements with limited budgets. What motivating factors led these agencies to spend their resources in this way, how have employees and the motoring public reacted, what efficiencies have been gained, and how adaptable are the new facilities to future growth? Have these agencies made wise decisions?

Emmet CRC: From Dingy and Hazardous to Bright, Clean, and Energy Efficient

In Emmet County, the road commission is housed in a main office in Harbor Springs, Michigan, and a satellite facility in Levering. By 2016, the Levering facility was not only well past its design life but was also an unpleasant work environment.

“We had an old 1928 garage that was really dark, really dingy with diesel soot all over the place,” related Brian Gutowski, Emmet CRC’s recently-retired engineer-manager, about the agency’s Levering facility. “And, I think the air quality wasn’t very good in there.” The garage was built with 12-foot

ceilings that could not accommodate the agency’s newer trucks, contained dark offices and a dark lunch room for the 16 employees staffing the facility, and had a defunct heater containing asbestos.

The Levering facility also had a 1940s Quonset hut where Emmet CRC’s mechanic worked during the winter months. “The hoist there was so old we had to take it out of service,” Gutowski said.

Outside the Levering facility’s gates was a fueling station, located on a dead-end public road. Gutowski added, “But, if anyone had the code, they could fill up their diesel tractors.”

For Emmet CRC, the solution for the “unpleasant, outdated” facility was new construction, which would require the existing facilities to be torn down, disposal of the defunct heater containing asbestos and, consequently, environmental clearances and soil testing. Gutowski shared, “We knew we would have to come up with some of our own cash to build a new facility so we had been setting aside a little bit of ‘seed’ money.”

In 2016, Emmet CRC began seeking bonds as a way to finance the endeavor. That process began with the road commission designing the new facility with the infrastructure consulting firm AECOM. With limitations of their old facility and a design

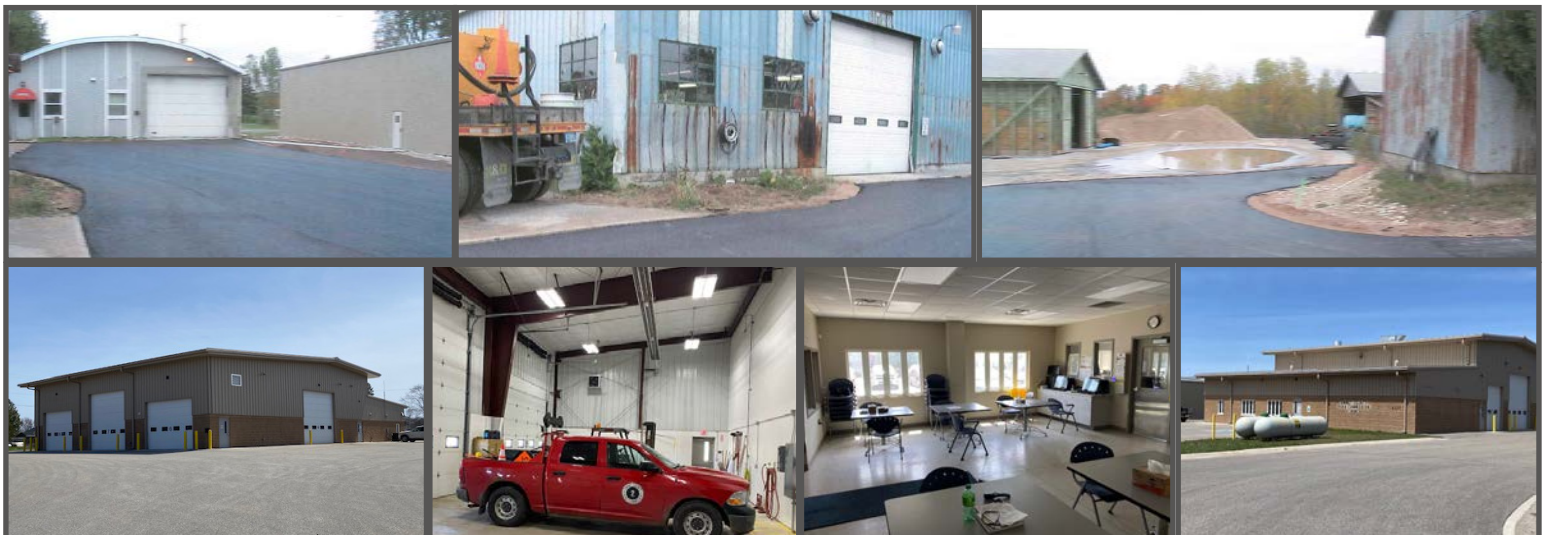
for a new facility in hand, Emmet CRC approached the county board to persuade them to issue a bond for the new construction.

“The key was bringing the politicians in to visit our facilities,” said Gutowski. “We can’t bond ourselves so we needed to get the county board to support the project.” In 2017, Gutowski gave a tour of the Levering facility to the county board members and their liaisons, who “quickly” became supportive of bonding the project when they saw the need. Local-area residents were also supportive because they knew old facility was “really, really poor”. “We weren’t planning to do something extravagant,” commented Gutowski, “just [simple], but a really nice facility—bright, clean, and energy efficient.”

Emmet CRC took out a bond for \$3.3 million. Of the bond money, Emmet CRC invested \$3 million in the Levering facility and directed \$300,000 toward a auxiliary facility in Conway, Michigan.

But, Emmet CRC’s efforts were worth it, according to Gutowski. He says the new facilities include “a modern office area for our road foreman, a nice locker room, a really nice lunchroom, a two-vehicle shop area with an in-floor hoist for the mechanic that works there full time and with ceilings that are high enough for him to work on any piece of

▶ continued on page 10



Emmet CRC’s Levering facility – Top row: Facilities prior to 2018; Bottom row: New facilities built in 2018 (Photos: Courtesy of Emmet CRC)



Left: Pressure washer; Right: Pressure washing the curb rail (Photos: Courtesy of IBA)

► Bidding Out the Second Project

At a board meeting in May 2022, a board member surprised Hansen by announcing that the Federal Bridge Corporation Limited (FBCL), a Canadian federal crown corporation that owns the Canadian half of the bridge, received a \$3 million grant for bridge preservation with the caveat that the work needed to be done by March 31, 2023, less than a year later. The IBA, through the Bridge Authority Board, administers the entire bridge on behalf of the FBCL and the U.S. owner—the Michigan Department of Transportation (MDOT)—under a binational agreement.

The IBA team again turned to the HRCSA one-coat system to preserve the green pedestrian railings and the ivory curb railings on the Canadian approach and mid-spans.

While funding for the project was a Canadian federal economic stimulus granted to FBCL and advertising for low bids for the HRCSA project was through FBCL, the IBA team was able to get competitive bids from three contractors who made mandatory site visits and to have the successful contractor mobilized on site and working within a “five-week time-frame”, according to Pete Petainen, bridge director of the IBA.

Part of the secret to their fast project bidding and selection process lay in the IBA team’s adoption of MDOT language for the project description. “From MDOT Innovative Contracts, Karl got the fixed-cost, variable-scope language, which says ‘Here’s the budget, how much can you get done?’” explained Petainen. In turn, the bids for painting using fixed cost/variable scope (FCVS) identify how many linear feet a contractor can provide for the same cost.

Savings in the Process

According to Hansen, the cost savings is not in the paint itself since HRCSA costs the same per gallon as zinc-rich paint systems. “HRCSA is a single-coat application,” he explained, adding that zinc-rich paints need three coats.

Furthermore, three-coat zinc-rich paint systems are intended to be applied as a completely new paint over steel that has been cleaned down to the bare metal. The single-coat HRCSA system, on the other hand, is intended to function as an overcoat for clean steel with old but competent paint still present.

“With the three-coat zinc, you have to sandblast, which means you have to set up enclosures with negative pressure, and then there are three coats of paint that get applied,” Hansen said, noting how the sandblasting removes all paint, leaving clean, bare steel. “With HRCSA, it’s water-blasting that’s used,” he continued, noting that the water-blasting technique removes dirt and failed paint that has become detached from the underlying surface and leaves behind the competent but old paint. “Also, the paint particles don’t become airborne and breathable with water-blasting and you don’t need negative pressure enclosures but only enclosures to keep large chunks of paint from flying off the bridge or into the lanes.”

Water-blasting on the International Bridge relies on a 7200-pounds-per-square-inch (psi) pressure washer that allows water to be heated up to 200-degrees Fahrenheit (93-degrees Celsius)—almost to the boiling point. “A lot of the water evaporates immediately,” noted Hansen. What doesn’t evaporate falls to the bridge deck and is collected along

with paint chips into a big plastic container using a vacuum. The water and paint chip mixture is flocculated in a three-step filtration process until the solids—down to the micron—separate from the water; then, the solids are sent to a disposal facility while the water is treated until it is acceptable to go into the city sewer system.

“Lead is involved on these railings,” Hansen added. “But, the lead paint that is being removed is not being made airborne so it’s much less risky for the people doing the work.” He reminisces that when the IBA put in a ticket for lead paint disposal, a representative from the Michigan Department of Environment, Great Lakes, and Energy (EGLE)—known as the Michigan Department of Environmental Quality (MDEQ) at the time of the project—made a site visit to the bridge. “When we explained the process, the MDEQ were pretty supportive.”

“So, that’s where the savings come in here: with the single-coat application and not having the costs of sandblasting containment,” concluded Hansen. Petainen added, “And, all the staging and labor associated with it!” The difference amounted to a 50-percent savings between the cost for the IBA’s 2017 Canadian arch project with HRCSA in comparison to the bids that came in for the same project as it was proposed in 2016 with the three-coat zinc-based paint system.

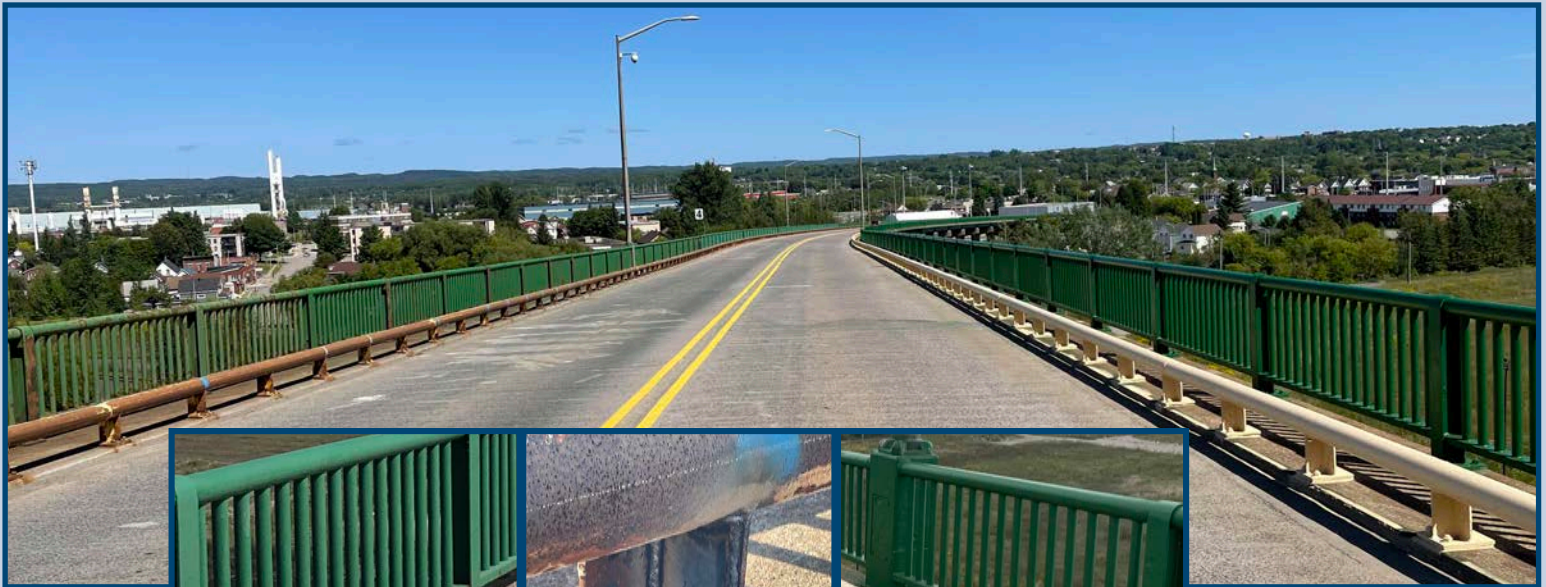
Bridge Railings Project

“We don’t use salt on the bridge [to limit corrosion] but rather a non-oxidizing deicer,” Marcus Eidenier, asset manager for the IBA, said. “However, traffic will bring up salt from the local streets and that salt, tracked up by the cars will drop on the bridge, which is where we see a lot of corrosion.”

The International Bridge has a traffic pattern that contributes to the corrosion patterns, according to Petainen. Eighty percent of the



Scaffolding for the bridge railings HRCSA paint project, 2022 (Photo: Courtesy of IBA)



Pedestrian and curb rail painted with HRCSA on east (right) side and not painted on west (left) side.

Inset—Left: Railings before painting; Middle: Repaired steel rail foot; Right: Railings after painting.

(Photos: Courtesy of IBA)

traffic volume is Canadian but, he explains, the traffic is “not one-way traffic but two-way”. He pointed out, “Whatever comes over has to go back.”

The corrosion patterns on the bridge, which match the traffic patterns, are the existence of significantly more rust damage on the side where traffic enters the bridge and less on the side where traffic exits the bridge. Eidenier explained, “To put the corrosion in perspective as far as deterioration on each side of the Canadian arch, we have had 22 steel rail repairs on the east side, which is the exiting lane for northbound traffic, and 148 on the west side, which is the entering lane for southbound traffic, for a total of 170.” The same patterns can be seen on the US portion of the bridge.

Therefore, the 2022 project addressing the Canadian portion of the bridge encompasses green pedestrian and ivory curb railings in three priority areas—the west side of the bridge up to the northernmost point of the Canadian arch, the east side up to the northernmost point of the Canadian arch, and from the southernmost point of the Canadian arch up to the flags in the middle of the bridge.

“The successful bidder actually bid 27 more meters than what were in the plans”, said Hansen. Not only that, the success-

ful bidder also included an additional subcontractor—an employee for the paint vendor—to perform quality assurance/quality control for the project over and above the IBA’s independently-hired local firm while still remaining within the proposed budget.

As part of the project, the IBA is addressing the feet that support the curb railing. Hansen said, “We’re having this paint put on because there’s a number of those that are beginning to fail with rust holes through them.”

Hansen, Petainen, and Eidenier agree that “preservation is key” for the International Bridge, and they see the HRCSA paint “stopping” the reaction that generates rust.

Tested, and Proving Itself

The IBA team decided to pique the interest of Jason DeRuyver, an engineer-manager for MDOT Bureau of Bridges and Structures who oversees the Priority Preservation Design Unit and Maintenance Support Unit, in the HRCSA one-coat system.

“We sent one of the old railings down to Jason,” Hansen related.

DeRuyver shared, “I’m always looking for new tools that our maintenance crews can use, and this appeared promising.” Since HRCSA doesn’t require sandblasting of the rusted metal, he says maintenance crews

could employ the paint system themselves. “Right now, they don’t do much painting,” he continued. “But, if they are out on a bridge doing a joint replacement or cleaning bearings, they could use this system to coat a beam end, top flange, or bearing if the existing paint system had failed.”

According to DeRuyver, he left a piece of the IBA’s railing, coated with HRCSA, in the yard and had some of the trucks salt it. “I just wanted to see how it would do sitting in the yard exposed to the salt and snow,” he explained. “I’m not sure how much salting it got after the initial passes and I haven’t touched it recently, but it looks to be faring well and it doesn’t look like the paint is failing more than I would expect.”

Under DeRuyver’s supervision, MDOT’s Structure Preservation Section also trialed HRCSA on a pedestrian bridge in 2018. The

▶ continued on next page



IBA railing now that DeRuyver salted (Photo: Courtesy of MDOT)



Stair support system (left) and base (right) of pedestrian bridge over US-31 in Traverse City painted with HRCSA as seen in 2021 inspection report (Photos: Courtesy of MDOT)

► bridge crosses over US-31 connecting a state campground to a beach in Traverse City and has stairs on both ends. Being situated next to the highway, it gets “substantial” salt spray.

The pedestrian bridge was suffering from rusty stair support systems and failed paint on the bases. The MDOT team coated the stair systems with HRCSA and, as of its 2021 inspection report, newly-painted portions appears to be lasting well. Hansen checked out the application in the summer of 2021 and noted, “It looked like the day they painted it!”

Benefits and Trade-offs

One notable characteristic of the HRCSA paint is its pliability, especially in comparison to zinc paint’s shinier, harder, more brittle set. As such, HRCSA accommodates the bridge’s expansion and contraction without cracking and failing as readily as other types of paint.

That beneficial characteristic comes with a drawback: “It does stay tacky for quite a while,” noted DeRuyver. Hansen added, “When our staff are climbing on the arch, they can feel it moving, and it’s an unnerving feeling.” This tacky or pliable characteristic of HRCSA means that “it stays softer and tackier than an epoxy hard-coat paint so it also picks up airborne particles and sediments much more readily”, said Petainen.

The ivory paint used for the Canadian arch in the 2017 project is “exhibiting discoloration now”, according to Hansen. He explained, “It’s not the paint, it’s something

that is precipitating out of the air.” The ivory paint now appears to be a dull gray, but the precipitate, likely coming from the nearby steel mill, comes off with soap, water, and “elbow grease”. Hansen continued, “We cleaned off a six-foot section of the upper half of the arch and want to see if precipitate keeps gathering.”

“You’re not going to see the same aesthetic or issues on the ivory curb rail as you are seeing in the arch,” said Hansen, noting that typical wear and tear to the curb rail paint minimizes the appearance of any dinginess. Petainen noted, “Semis scrape on the curb rail constantly.”

The green paint is a different story. “You can’t see that precipitate at all on the green girders,” said Hansen. “The green railing does not show it either to the extent that the ivory one does.” He also points out that the pedestrian bridge in Traverse City is exhibiting no discoloration at all.

But, a “dingier” appearance of the lighter-color paint doesn’t outweigh the potential cost benefit for Petainen. And, neither for Hansen: “It’s half the price, right now the money’s tight, and in general the life cycle is the same as a three-coat zinc paint.”

“We’ve also seen pack-rust being arrested,” highlighted Petainen. “That’s a huge benefit, so do we go for aesthetics or do we go for performance and life cycle?”

In addition to cost benefits, corrosion arrestment and reduction potential, pliability, and a comparable life cycle to three-coat zinc paint systems, HRCSA being a one-coat

application also allowed the IBA to cut the 2017 project length in half. “For a three-coat, it would have been two years,” said Eidenier, “and we were able to do it in one.”

Advice

Petainen calls HRCSA a “suitable alternative” to the traditional three-coat systems. Nonetheless, he conceded, “If I had a choice just based on aesthetics and what we’ve done historically and staff having to work on the structure, I would prefer to go to a three-coat system.”

But, for him, that choice gives way to HRCSA in the face of increasing costs, containment issues, remediation and removal, and longer lane closure times associated with other maintenance solutions. He concluded, “When it comes to trying to find solutions to problems, this is just one tool in the tool kit.”

DeRuyver, too, sees value in HRCSA. “I still have plans to get HRCSA out to our maintenance folks to add to their tool bag as something they can do themselves,” he said.

Hansen added, “When you consider that you could do two bridges with HRCSA for the price of one zinc-wise, that’s pretty big when the funding is as limited as it is.” ■

RESOURCES

1. FHWA. Performance Evaluation of One-coat Systems for New Steel Bridges. Publication No. FHWA-HRT-11-046. US Department of Transportation, McLean, Virginia, 2011. Available: <https://www.fhwa.dot.gov/publications/research/infrastructure/bridge/11046/11046.pdf>

A special provision for HRCSA is currently in development by the Michigan Department of Transportation.

Serving Michigan's Local Road-owning Agencies: The CTT's Newest Staff

Allison Szlachta – Intern
Center for Technology & Training

Ingrid Sandberg is the Center for Technology & Training's (CTT) newest research engineer who began working full-time for the CTT in January of 2022. Ingrid is a fourth generation resident of the Keweenaw and has a family history in highway maintenance. She shared, "My maternal grandpa worked for the MDOT garage in L'Anse and my dad, Bogue Sandberg, worked for the Baraga County Road Commission when he was in college." Her dad served as a professor in the civil engineering department at nearby Michigan Technological University. "I knew a little bit about civil engineering from him," she continued. From high school through her undergraduate, Ingrid had an internship with Michigan Tech Facilities. She added, "That was while they were constructing Rehki Hall and the addition to the library, and I fell in love with construction engineering."

Ingrid earned her undergraduate and graduate degrees from Michigan Tech in civil engineering, focusing her coursework on geotechnical engineering. After graduation, she worked for a consulting company in Fairbanks, Alaska, for about six years before transferring to their office in Denver, Colorado, where she worked for another three years. As a consultant, Ingrid spent time in the field on construction sites and behind a drill rig collecting soil samples as well as in the office designing pavements and both shallow and deep foundations. Ingrid recalled, "I liked consulting, working with the younger staff engineers, and doing teaching and training."

For Ingrid, joining the CTT team was a way to combine the "problem solving, teaching, and training" aspects of the consulting world with helping clients first hand. "I like learning new things and sharing them with people," she shared. "When I was a consultant I taught myself how to use GIS software so that I could take advantage of maps and Lidar data, and then I taught my coworkers so that we all could benefit."

One way that Ingrid is making an impact on CTT clients from Michigan's road-owning agencies is by providing training and assistance at the CTT's many conferences and workshops. She presented a full day at Michigan Bridge Week on "Quality Control & Quality Assurance" and is developing new

content for a workshop at the 2023 Michigan Bridge Week. "We had a great response to last year's presentation and workshop and I'm excited to expand on that," she said. "I like the challenge of taking an unexciting topic and making it interesting for our attendees."

As a geotechnical engineer, she's bringing a unique edge to the CTT's training events and technical assistance opportunities. She explains that geotechnical engineering deals with "naturally-occurring materials like soil and rock" and, as such, requires the skill to work with what is there and the ability to adapt to existing conditions while never fully knowing them. "Some of that uncertainty appeals to me," she continued. "It requires a lot of judgment and a lot of experience and some problem solving."

At this year's UP Road Builder meeting, she also presented on soil borings. "Soil borings are a way to quantify institutional knowledge about how your roads are performing," Ingrid explained. "Having that information can help you make informed decisions about the best way to manage them."

She and Zack Fredin, another CTT research engineer, are now working to develop a brand new pile driving inspection webinar this spring. Ingrid's hope is that this new training will "simulate what being on-site during pile driving is like".

Outside of work, Ingrid enjoys spending time with her family and friends now that she is living in her hometown again. "It's been really wonderful to get to connect with a lot of people that I did not get to spend much time with when I lived in Alaska." She has also recently taught herself to cross-stitch. "I've been having a fun time cross-stitching miniature versions of famous paintings," she shared. "Hopefully they will be framed and I will have them in my office soon."

"I enjoy getting to know the people who work for road-owning agencies in Michigan, and I look forward to meeting more of you!

Please connect with me on LinkedIn because I really like to hear about what people are doing all over the state.
– Ingrid Sandberg

<https://www.linkedin.com/in/ingrid-sandberg/>



Ingrid Sandberg

She says if CTT clients are in the Houghton area, they should "stop by campus and say hello... I'd love to meet you in person!"

Tammy Hodson is the Center for Technology & Training's (CTT) new business and training support specialist.

Before joining the CTT, Tammy attended Grand Valley State University for a degree in biology and has spent the past thirty years doing teaching, training, payroll management, accounting, and human resources in various industries. Over the years, she says she "spent a lot of time traveling for work". She shared, "Although I loved teaching on the road, I was anticipating building a home so I was looking for more of a 9-5 position." When visiting her daughter who attended Michigan Tech, Tammy decided to move to the Keweenaw and joined Michigan Technological University staff in 2020 as facilities manager for the university's Memorial Union Building, which houses the student union and event spaces.

Tammy became part of the CTT team in fall of 2021 and is on the CTT's front line for assisting clients, sometimes being one of the first voices CTT clients hear on the phone when calling the office.

Since joining the CTT, Tammy has already met a number of CTT clients in person at the Michigan Highway Maintenance Conference in Bellaire. There, she helped to ensure that "everything ran smoothly in a support role". She added, "It looks like I will have the opportunity to be more involved

► continued on next page

CTT's Newest Staff (continued from page 7)

► with the CTT's on-site events next year."

At present, Tammy says her "main focus is the virtual events". She coordinates with the presenters when scheduling the event and creating the Zoom room to address specific needs of the event like custom Zoom controls, poll questions, and accessibility of relevant shareable resources for attendees. She is also compiling past webinar recordings into a resource library to make recordings of specific events available to participants with the click of a link.

The best part of the virtual events, says Tammy, is "when we are able to successfully deliver the finished product to our clients". During a virtual event, Tammy acts as a moderator. "I provide introductions for the presenters and relay pertinent information about the webinar to the participants," she shared. "And, I manage any needs of the presenters or participants during the session."

When it comes to the array of other duties and responsibilities that Tammy has, she quipped, "My job is really 'see a need, fill a need'." She is cross-trained on some of the responsibilities of the CTT's project manager

for training and operations (Allison Berryman) and events specialist (Cynthia Elder) to help with registrations for events and to answer client questions over the phone and by e-mail.

But, that's not all. Her "very eclectic" position also includes accounting and payroll duties. For example, Tammy processes and reconciles client payments, both check and credit card, regularly. She also approves bi-weekly payroll for CTT staff and conducts monthly audits of CTT accounts.

Tammy says she most enjoys interacting with CTT clients and presenters, using their feedback to improve CTT trainings. "I love seeing our numbers growing—we've been able to offer several new trainings and other resources to assist our clients," she enthused.

When she's not working at the CTT, Tammy can be found working on her house. "I'm building my house by myself—I don't have a builder—so that pretty much consumes everything in my life right now." She began building the property shortly after moving to the Houghton area and is very thankful to have come such a long way since then. "I

spent six months living in my camper [so] I'm just glad the house is livable now," shared Tammy. "From the free reclaimed barnwood ceiling to the found stone hearth, each piece is unique and exactly the way I want it." She says that building her own house is a "real source of pride and accomplishment" for her. Tammy is very excited not only to continue the construction of her home but also to grow in her career with the CTT. ■



Tammy Hodson

Technology "Woven" into Asphalt (see facing page)



Left: Top left – Breitung Avenue before the 2018 project exhibiting cracking in the wheel path, Top right – Breitung Avenue in 2018 with left side of road paved and open to traffic and right side of road with milled surface, Bottom – Breitung Avenue in 2022 paved with FRA and crack sealed.

Lower right: Breitung Avenue FRA paved lanes and conventional asphalt shoulder.

(Photos: Courtesy of Dickinson CRC)



Technology “Woven” into Asphalt

A Follow-up on a Michigan Fiber-reinforced Asphalt Paving Project

Sydney Watilla-Sprague – Intern
Center for Technology & Training

In 2018, Dickinson County Road Commission (CRC) finished a mill and overlay project using fiber-reinforced asphalt (FRA) on Breitung Avenue in Kingsford, Michigan (see *The Bridge* 32.2).

Prior to the 2018 project, Breitung Avenue’s 20-year-old pavement had a surface rating of about 2 or 3 using the 10-point Pavement Surface Evaluation and Rating (PASER) system¹, according to Lance Malburg, engineer at Dickinson CRC. Breitung Avenue was experiencing alligator cracking, debonding, rutting, and stresses related to a widening of the road 15 years beforehand reflecting up to the surface. “The road at the time was in poor shape,” shared Malburg.

These conditions typically would require heavy rehabilitation, such as a crush and shape. A crush and shape involves pulverizing all of the existing asphalt layers and at least a couple inches of the underlying gravel before compacting the material and placing new asphalt. For the Breitung Avenue project, a crush and shape price tag was \$790,349.

Dickinson CRC could only afford to do a mill and overlay to address Breitung Avenue. Generally, this kind of project removes and replaces a portion of the asphalt pavement. “There wasn’t enough money to do anything else,” Malburg said, “so I made the strongest mill and overlay I possibly could using FRA.”

FRA is a type of asphalt where small fibers—like aramid, lignin, tire, cellulose, and even coconut fibers—are introduced in the mixing process to help strengthen the asphalt.

“We knew it wouldn’t be the same as a new construction,” he conceded. But, Malburg and his team considered the benefits of FRA like rutting and cracking resistance and a short construction period. They decided to surface Breitung Avenue with an asphalt mixed with aramid fibers—the same type of fiber used to manufacture Kevlar®, which is a bullet-proof material—coated with Sasobit® wax, which facilitates the handling and distribution of the fibers in the asphalt mix.

“We milled off an inch and a half of the surface of the driving lanes, but not the shoulders,” explained Malburg, saying that what he saw underneath was “clearly a PASER score of 2 or less”. With that PASER

score, Malburg anticipated the resurfacing to be a short-lived treatment, with the road soon returning to its pre-treatment condition. In scoping the project, he says they had hoped for a seven- to nine-year fix. But, after seeing the underlying asphalt, they weren’t so sure. “We were just hoping to get what we could in terms of service life and maybe find some different funding in the future,” Malburg shared.

Nonetheless, Dickinson CRC continued with the project. Malburg detailed, “We worked on top of the remaining 3 inches of pavement that was in poor shape and, everything we had milled off, we put back with the fiber reinforced asphalt.” Malburg notes that the 1.5 inches of new FRA laid just like conventional asphalt.

At the end of construction, the official cost of the project was \$331,587—less than half of what a crush and shape would have cost—and required only four days of construction.

Breitung Avenue Today

To their surprise, Malburg and the Dickinson CRC team say that Breitung Avenue’s deterioration since the 2018 project has been on par with other roads in the county. For example, another road—CR 569—with similar PASER scores also underwent work during the same summer as the Breitung Avenue project. “CR 569 was our traditional crush, shape, and pave,” Malburg said. “It doesn’t have the same traffic as Breitung Avenue, which is our second busiest road in the county, but we’ve been comparing Breitung Avenue against it.”

He acknowledges that Breitung Avenue is exhibiting “some cracking and wear”, but no more than other four- to five-year-old roads in the county. Notably, he says it’s not “shoving and rutting like other pavements would” even though the road serves as a thoroughfare for truck traffic accessing industries in Kingsford, Michigan. He says road users have expressed satisfaction that the “ruts are gone and the road’s smoother”.

“The only drawbacks were needing additional equipment at the plant to mix the fibers, and the contractor had a small learning curve getting the mix right,” Malburg noted. Dickinson CRC did have to seal the road right away due to cracks developing in areas where the

fibers didn’t mix in properly with the asphalt.

However, while Malburg does acknowledge that FRA “does cost a little more” than a conventional asphalt mix, he believes he is seeing long-term savings in maintenance costs. “Maintenance on it is less,” he explained. “It is a stronger asphalt; it does minimize cracking, shoving, and rutting better than traditional pavement; and it seems to be applicable on higher-traffic roads.”

A Subject of Study

A research team at Michigan Technological University under the supervision of Dr. Zhanping You, a professor at the university, published an article corroborating Dickinson CRC’s experience with the FRA on Breitung Avenue. In the October 2021 article, Ge, et al., state that modified fibers increased Breitung Avenue’s pavement performance in terms of rutting, moisture stability, and cracking.²

The research team compared a 0.8-mile strip of Breitung Avenue paved with asphalt alone to a 1.5-mile strip paved with asphalt containing Sasobit-coated aramid fibers at one year, two years, and 31 months after the 2018 project.¹ What they found was that the FRA increased Breitung Avenue’s rut resistance and moisture stability with statistical significance, improved cracking resistance even at lower temperatures, and enhanced elasticity.²

Potential Solution

Looking back on the 2018 project, Malburg reflected, “We really put it on a road that was too far gone for an overlay and it’s performing really well.”

He says that local agencies should “go for it” if they’re finding FRA to be a potential maintenance solution for their particular circumstances. ■

RESOURCES

1. Center for Technology & Training. TAMC Data Collection Training - 2023 PASER - IBR – <http://www.ctt.mtu.edu/sites/ctt/files/flyers/2023paseribr.pdf> | Asset Management Resources – <http://ctt.mtu.edu/asset-management-resources>
2. Ge, D., Jin, D., Liu, C., Gao, J., Yu, M., Malburg, L., & You, Z. (2022). Laboratory Performance and Field Case Study of Asphalt Mixture with Sasobit Treated Aramid Fiber as Modifier. *Transportation Research Record*, 2676(2), 811–824. <https://doi.org/10.1177/03611981211047833>

► equipment, a heated truck storage facility so we can park every single piece of equipment inside, an attached garage off our main office area where we can store our mowers and pick-up trucks, and high-capacity diesel pumps with a new underground storage tank now inside the fence”. Gutowski continued, “We also put in a couple of pre-wet tanks in the salt storage building, so that was one of the other benefits of expanding.”

Some of those improvements have gained noticeable efficiencies that impact both employees and road users. “We have good employees at the Levering facility and we want to make sure that they had a nice facility where they enjoyed coming into work,” Gutowski said. “In the past when we had a bad snowstorm, the employees had to heat up their trucks just to get the windshields cleared off and had to chip away at the plows that were frozen shut.” Now, he says having indoor vehicle storage means that, during a snowstorm, employees find their trucks fully thawed and ready to go. Improvements to the salt-loading area both facilitates trucks in accessing the area safely and enables multiple trucks to be in the salt-loading area at one time. And, with the fueling station inside the grounds, employees can fuel up Emmet CRC trucks more quickly. Gutowski reflected on those efficiencies, saying, “The residents in the north end of our county are being serviced a lot better now...we don’t get as many complaints about service.”

The more efficient facility is translating to cost savings, as well. Gutowski points out heating costs as one area where the road commission is seeing substantial savings. “We were spending about \$10,000 or \$11,000 a year just to heat the two inefficient original facilities,” he said. The new facility was constructed with radiant heat for the equipment and truck storage areas and a high-efficiency furnace for the office areas. Over the new facility’s first winter, Emmet CRC saw a savings of \$5,000 in heating costs.

Gutowski has few regrets about the new facility. “I wish we had maybe another 10 acres of flat area that we could have built on,” he said in retrospect. “But the space where we’re located right now, it’s a very good location and right on a primary road, and the new facility, it is nice, bright, clean, top-notch, and energy efficient!”

Houghton CRC: When Disaster Leads to a Design-Build

For Houghton CRC, disaster prompted them to reconsider their facilities. “We used to have a building that we used for cold storage with the intent of eventually moving all our facilities to the acreage on which it stood,” shared Kevin Harju, engineer-manager of the Houghton CRC, about a satellite facility they owned six miles south of their main site in Ripley, Michigan. The building was formerly used for furniture making and had low ceilings and flat floors with no drains. In the late 1990s, the Houghton CRC conducted a study in conjunction with students from the nearby Michigan Technological University to determine how much it would cost to move all of the road commission’s facilities to the satellite location. “It was close to \$10 million,” Harju said. “We have quite a few buildings on our main site—buildings that are heated for our plow trucks in the winter, the maintenance facility, the office, and a welding shop.” With that estimated expense, the plans were shelved.

After the 2012-2013 winter season’s heavy snowfall, the unanticipated happened at Houghton CRC’s satellite facility: “In April 2013, the roof of our cold storage collapsed,” related Harju. “We had an insurance claim for the building that was just shy of one million dollars.”

He says that insurance initially only considered replacing the building on its same site but, after a year of discussions conceded that it didn’t make sense to rebuild in that location. All eyes turned toward the main site where they had an established garage. “We decided to build in Ripley because we have a lot of other buildings that we operate out of at that site already,” Harju explained.

“Like a lot of the road commissions throughout the state, financing is a big issue,” he continued. “Our final cost for the

new building ended up being \$1.47 million.” To make up for the difference between what insurance would cover and what they would construct, Houghton CRC relied on their general fund and the sale of their old main office building that was in a prime location on the nearby waterfront.

But, constructing new facilities on the more-confined Ripley site meant that Houghton CRC would need to remove a 100-year-old maintenance shop as well as its existing welding shop to make room for the new building. “We built the biggest building we could fit in the footprint that we had,” Harju added.

Designing the new facility began with needs assessments and visits to other road commissions with newer buildings to learn what worked and what didn’t. Houghton CRC, for example, opted for high-efficiency, standalone forced-air heaters instead of in-floor heating after learning about one agency’s humidity control challenges due to the combination of in-floor heating and snow tracked in by the plow trucks. “We have a switch built into all of our large overhead doors that will not allow our heaters to run if any of the doors are open,” shared Harju. “This helps save a lot in heating costs in addition to the employees wanting to close the doors ASAP to keep the shop warm.”

Following a design-build process, Houghton CRC outlined what they wanted in the new building and then requested proposals in early 2014. Construction firms that submitted proposals each drafted their own design of a facility that would meet Houghton CRC’s needs. “We selected one firm, but we ended up totally revamping their initial proposal,” Harju shared. He points out that the design build process had “a lot of dynamics” with “construction going on while the plans were being finalized”.

During construction, Houghton CRC



Houghton CRC’s old facilities – Left: Cold storage after roof collapse in 2013; Right: Original 100-year-old maintenance shop (Photos: Courtesy of Houghton CRC)



Houghton CRC's new facilities, built in 2015, that house main office, maintenance area, and a dedicated welding area (Photos: Courtesy of Houghton CRC)

encountered challenges like needing to place 25-foot-deep helical piles to reinforce the new facility's footings. But, Harju says the "biggest challenge" was "all of the construction going on while trying to do normal business". He elaborated, "Our yard was ripped apart for the entire winter!"

The new building now houses Houghton CRC's main office, a maintenance area, and a dedicated welding area. The building features an open floor plan and plenty of natural light.

"The maintenance area has four garage doors for equipment," said Harju, comparing it to their old shop that had only one door. "We don't get congestion with a vehicle in the front of the building that was repaired but couldn't get out because equipment was being worked on behind it." The high ceilings allow for lifting dump boxes completely. "The mechanics can work on them inside instead of having to be out in the winter weather troubleshooting issues," he noted.

Harju continued, "We also have overhead cranes that can pull a motor out of one piece of equipment and move it across the maintenance garage and place it in another vehicle or on a pallet for shipment and lifts that can raise equipment high enough off the ground so that a mechanic can walk underneath to work on it." He says some mechanics even reconsidered retiring because of the features of the new facility.

But, what does the new building mean in terms of a road commission resources like time and money? "It's definitely a time savings," said Harju, pointing out how the overhead cranes and lifts makes working on

equipment easier and faster. "And, we have big cost savings in terms of heating," he continued, noting that the two forced-air heaters heat the maintenance area and an oil burner heats the garage and runs on the agency's waste oil. "We're not using any natural gas and essentially using the oil that we no longer have a use for, which is a big savings when considering the size of this building."

In retrospect, Harju says it's the size of the building that he would change. "I would make it even larger," he shared. "It's like building a personal garage and you think it's huge but, in a couple years, you're wishing it was bigger because you have filled it up: you can always use the extra space." Nonetheless, he notes that the new Houghton CRC facility attracts other road-owning agencies interested in modifying their own facilities.

Hands down, Harju would recommend the design-build process for constructing the new building. "It saved a lot of money in construction, it's very competitive, and a lot of good ideas came from it," he reflected.

Kent CRC: Space to Support a Mission

Like Houghton CRC, space played a role in the decision-making process for Kent CRC's plan for new facilities. But, unlike Houghton CRC, Kent CRC was able to anticipate the timing of their construction and opted to relocate their main site.

"We have a strategic plan in which we identify a myriad of priorities consistent with our organizational objectives focused on safety, routine maintenance, and improving our primary and local road network," shared Steve

Warren, managing director of Kent CRC. "In order to achieve and implement these objectives, we need snow plow trucks, heavy equipment, other pieces of machinery, and adequate facilities and capacity." So, Kent CRC began saving "many years ago" for new facilities.

Up until construction began in 2021, they've been headquartered in a 100-year-old facility just north of downtown Grand Rapids. The 14-acre site is home to Kent CRC's administration building, one of its four maintenance garages where much of Kent CRC's truck assembly occurs, and a salt dome.

"Several years ago, we acquired 30 acres in what's called the Walker View Industrial Park, north of downtown just off Four Mile Road near the Walker Avenue interchange," Warren said. He points out that the new location will make access to roads it must clear during winter storms much easier since it is situated adjacent to the county road network and in close proximity to I-96. "Our desire to relocate is primarily driven by the need to expand our maintenance facility—to expand our vehicle assembly and maintenance bays," he added.

Relocation means that Kent CRC needs to sell off its current facility, and the City of Grand Rapids is poised to buy it. "That was a win-win-win," Warren exclaimed. "It's a win for us to be able to sell the property and move forward with our relocation, it's a win for the City of Grand Rapids to move off their riverfront location downtown, and it is a win for the community because that property along the river can be repurposed for other enterprises, creating additional tax base downtown."

► continued on next page



Kent CRC's facilities – Left: Current facilities; Right: A rendering of the new facilities (Photos: Courtesy of Kent CRC)

► Between savings and the sale of its current facility, Kent CRC was able to pay for 50 percent of the new facility in cash. The remainder of the funds are being borrowed through bonding for the \$50 million project. “I don’t like to borrow too much money, so having a good financial model is critical.”

The size and complexity of building a road commission administrative building, maintenance garage with 10 larger-sized bays, 6000-ton salt storage, lean-to storage, vehicle wash building, and a fuel station made it a challenge to select the “right” architect and construction manager. “The architect had to have experience, good credentials and references, so we went through an exhaustive process of putting out requests for proposals and interviewing them,” related Warren, who called upon a subcommittee of the CRC board to help with the selection.

Through the whole process, he’s not only been depending upon board members for input and guidance, but also involving two staff members who know Kent CRC operations and can act as project coordinators. “Things happen so fast,” stated Warren, who says he takes big questions or change orders to the board for their review. “But, for other things, the architect and construction manager need to move forward efficiently and can’t wait, so sometimes I make the decision but they can also go to the project coordinators for feedback.”

The new complex, scheduled to be completed in 2023, will be modern and safer, according to Warren. “For the administration building, we’re doing a more open and collaborative environment, smaller efficient workstations, huddle spaces, and conference rooms for interaction and privacy and doing things like web-based meetings,” he said. Plus, being able to “start from scratch” means

they won’t need to retrofit the building for wiring for new technology and for placing wireless technology, but that the building itself will be designed with new technologies in mind. Warren added, “We were pleased to make a more collaborative, more efficient space with much fewer square feet.”

“The primary driver of this move is the maintenance facility,” he continued. The new maintenance facility will be 150,000 square feet, twice the size of the current facility at Kent CRC’s main site and a size that will allow the road commission to park more of its vehicles inside. With two additional maintenance bays and all 10 maintenance bays being larger than what the road commission currently has, Warren says the mechanics will have more room to work and move around the vehicles. “We build about eight to ten trucks a year, so that additional capacity will make that operation more efficient by being able to work on multiple vehicles at the same time,” he shared.

The new salt building will have lean-tos for storing other equipment, like tractors and plow blades.

“We’re going to have a dedicated wash building for our large equipment,” detailed Warren. One bay will be a manual wash with catwalks to enable cleaning from above while the other bay will be a semi-automated drive-through truck wash to help clean the entire vehicle including the underbody. Warren continued, “Of course, our trucks have a lot of sand and salt on them and need to be kept clean, but this also will help keep our facility clean.”

“We’re also spending time on things like safety and security: making sure that, as people circulate around the site, the logistics are set up to avoid conflicts,” Warren added.

The entire endeavor is about gaining ef-

iciency: “Obviously, energy efficiency is important,” stated Warren, noting that the new facility will rely on “state-of-the-art” heating and cooling systems and air handlers. “We’re also setting up a smaller, more efficient office operation using a concept called ‘system furniture’ where most of the walls within this facility are movable.” With that strategy, Kent CRC is reducing the square footage of its administration space by 30 percent while gaining more flexibility in terms of office dynamics as functions expand or consolidate. And, those gains, says Warren, support and advance Kent CRC’s mission.

“I think you need to understand why you’re building a new facility because you’re going to be asked why from your stakeholders, from your board, and from the public,” Warren reflected. “Building a new facility, it has to be considered in the context of everything you do and how it supports the needs of the public.”

RCKC: When Fiscal Responsibility Meets a Need for New Space

Similar to Kent CRC, the Road Commission for Kalamazoo County (RCKC) is relocating. “We’ve been at our current facility since the 1940s,” explained Sarah Phillips, communications administrator at RCKC. “We operate out of a single garage/facility.”

That present space is a “landlocked parcel adjacent to wetlands”, according to Michael Boersma, member of the county board of road commissioners for Kalamazoo County. Of RCKC’s 17.35 acres, 3.17 cannot be developed as they are low-lying lands (wetlands) not suitable for building.

Situated on the acreage are a 1940s garage, a 1960s administration building, a 1970s vehicle maintenance building, and a salt storage shed. Boersma shared, “Being so

close to the wetlands, there's flooding of the basement in heavy rains and no way for new construction on our site."

Boersma says that RCKC was setting aside money for its facilities well before his appointment to the board in 2018. Then, in 2019, RCKC conducted a site survey to determine the feasibility of upgrading the present site to meet RCKC's current and future needs.

That site survey, according to Phillips, identified "a list of necessary renovations and improvements". One of the most significant improvements needed was for the deteriorating salt storage building, which posed an environmental threat since it is situated close to Davis Creek. "Its wood walls and support structures are rapidly reaching their end of life," Phillips noted. The administration building also suffered from a leaking roof that needed immediate replacement as well as other safety issues.

Aging facilities also means the buildings weren't designed for today's equipment. "In the 1940s, the equipment was smaller," said Phillips. "And, the number of roads we maintain was smaller, so we needed less equipment." RCKC staff has also grown in size.

Consequent to growth of the road network and number of employees, capacity is an issue. "The salt storage doesn't currently meet our capacity needs," explained Phillips. She also points out that the "administration building only has two meeting rooms and a difficult-to-access board room" in the basement that often falls victim to flooding. Phillips says that RCKC's desperate need for space also led them to "convert a supply closet into an office, too".

Most importantly, the site survey concluded that upgrades to the existing site would not meet RCKC's needs because of the property's limited size, notes Boersma. Phillips added, "The facility itself and the



RCKC's current facilities – Top left: Administration building; Right: Salt storage; Bottom left: Landlocked 13-acre campus (Photos: Courtesy of RCKC)

grounds just don't meet our current capacity needs and our anticipated future growth."

So, in 2020, RCKC purchased a 40-acre property, two miles east of their present facility and situated on 26th Street, in Comstock Township. The new facilities for the 40-acre property are being designed for RCKC's current and future needs.

"One of the more unique design pieces of the new facility was the development for individual offices in one centralized location with a centralized break room as well," shared Bill Zaske, senior project manager for Fishbeck. He says that design element was a result of RCKC's steering committee, which "allowed for diverse voices to contribute ideas". The new administration building will provide "more opportunity for communication and interaction between all areas of the team with a goal of creating a sense of equity and cohesiveness", according to Zaske. He chimed, "Everyone in one home, unified!"

Zaske says the new maintenance facility will be state-of-the-art. "For example, the

vehicle storage facility will be equipped with an under-floor air distribution system that will force warm air under the vehicles," he shared. "This will quickly melt ice and snow, allowing for a faster turnaround for getting trucks out onto the road."

The new salt and sand building will be 170 feet wide, 90 feet larger than the present building. With the present salt building, trucks have to load up outside if the building is full or back in one at a time if there's room. The new building will be large enough for RCKC to buy and store more materials in bulk while providing a space for trucks to drive through the building for the loading process. The new building's abutments will serve as covered equipment storage, allowing more of RCKC's equipment to be stored under roof.

RCKC is anticipating the new salt and sand building's spray boom. "We've been spraying our liquid deicer on salt in house

▶ continued on next page



RCKC's new facilities – Left: New salt storage under construction; Right: A rendering of the new facilities (Photos: Courtesy of RCKC)

Michigan LTAP

Great Ideas

2023 Challenge

Shining a spotlight on local road agency innovations for a brighter Michigan

Share your innovation! Win prizes! Learn more: www.MichiganLTAP.org/GreatIdeas

For agencies with drinking water, storm water, or waste water utilities...

Get **FREE** technical assistance and training for managing and financing projects on water utility systems, land-use planning, recycling, and solid-waste and energy-use reduction programs.

Learn more at gleic.org

Great Lakes Environmental Infrastructure Center
Environmental Finance Center for EPA Region 5
Located at Michigan Technological University

New Facilities (continued from page 13)

► using multiple spray booms attached to the bottom of the roof trusses that we installed ourselves,” related Travis Bartholomew, operations director for RCKC. “The new building will have one single spray boom with a series of spray nozzles that can travel back and forth on a track over the top of the pile.” The new system will be “easier to maintain, maneuver, and reach, saving time in servicing and maintenance”.

Bartholomew says the new facility will also feature a covered, low-profile (i.e., closer to the ground) platform scale system with automated transactions using a software app. The safer design, he says, will allow drivers to scale loads “from the driver’s seat”.

The new facility will also feature a vehicle storage facility large enough to store all of RCKC’s vehicles and equipment comfortably with room to grow. “The building is designed to store all of the RCKC plow trucks in the center portion of the building with additional space around the perimeter for smaller vehicles, passenger trucks, loaders, graders and space for growth in mind,” said Bartholomew. Having all the fleet vehicles and equipment parked inside will improve service life of the RCKC fleet and efficiencies of their operations.

There will also be a wash building with additional equipment. “It was designed with multifunctional use in mind,” he commented. “Future expansion, specific use, and site ef-

iciency were large considerations for many of the design choices of the new facility.”

As designed to meet RCKC’s needs and with an eye on future growth, the new facility is expected to cost \$65 million, which RCKC couldn’t afford on its own.

So, before embarking on the new facilities project, RCKC had to “convince ourselves first that this was a fiscally-responsible decision”, according Joanna Johnson, managing director of the road commission. She says that RCKC then held tours of the current facility for the county board, delivered a presentation on the current facility to the board, and offered explanations of the proposal to relocate and build new facilities in order to gain the county board’s support. “Start conversations early with those from whom you seek approval, and invite those decision makers in to see the reasons for themselves,” she emphasized.

Using this approach, RCKC was able to “convince the county board of commissioners to issue bonds”, shares Boersma. He says the issuance was “based in a large part on RCKC’s history of being fiscally responsible”. The county board’s decision to bond the project was “unanimous”, according to Johnson. She added, “Funding the bond payments will come from Michigan Transportation Funding, as this is the only source of funding for operating expenses.”

But, Boersma points out that paying for

the project won’t affect Kalamazoo County road users: “RCKC has committed to paying off the bonds without needing to change its level of service to the community.”

RCKC is aiming to have the salt and sand building complete before winter of 2022-2023. The remainder of the move should be complete by mid-2024.

Wise Decisions

These four road-owning agencies were motivated by creating more usable, more efficient, more adaptable facilities. The decision to build anew resets the clock on obsolescence of an agency’s aging buildings, most notably obsolescence due to a building being unable to accommodate agencies’ larger vehicles of today. New facilities mean that these road-owning agencies are now able to repair and build fleet vehicles faster and to load deicing and anti-icing materials quicker which, in turn, means these agencies are able to provide better service to road users. New tools and cleaner spaces designed for current functions and to adapt to future functions are helping these agencies retain and attract employees. Have these agencies made wise decisions? The answer to that question might be found in the words of English philosopher and statesman Sir Francis Bacon: “A wise [agency] will make more opportunities than [it] finds.” It seems these agencies have done that. ■

Motor Grader Training

Training Opportunities by Request



Maintaining unpaved road surfaces requires operators to use specialized skills, abilities, knowledge, and applied techniques that are only acquired over time.

Operators must continually improve upon their skills and knowledge through practice and by learning new insights about unpaved road maintenance.

The Center for Technology & Training offers Motor Grader Training for local road-owning agency employees.

Learn more at
ctt.mtu.edu/training-request
or contact ctt@mtu.edu.

The Bridge

The Bridge is published quarterly by the Center for Technology & Training (CTT) through Michigan's Local Technical Assistance Program at Michigan Technological University. Subscriptions are free of charge. To request a subscription, contact the CTT.

Michigan's Local Technical Assistance Program

Center for Technology & Training
Michigan Technological University
309 Dillman Hall
1400 Townsend Dr.
Houghton, MI 49931-1295

Telephone 906-487-2102
Fax 906-487-3409
E-mail CTT@mtu.edu
Website MichiganLTAP.org

© Copyright 2022 Michigan Technological University. To obtain permission to reprint any articles or graphics from The Bridge, please contact the CTT.

The Bridge is printed with soy-based ink on recycled, acid-free paper (50% recycled, 10% post-consumer waste). 4,000 copies mailed this edition.

Michigan LTAP Staff

Administration

Tim Colling, PhD, PE Director
Christine Codere Sr. Support Specialist
Cynthia Elder Events Specialist
Tammy Hodson Business/Training Support Specialist
Noah Rule Marketing Specialist

Writing

Victoria S Kaplewski, MS Editor, Technical Writer
Hannah Bershing Technical Writing Intern
Allison Szlachta General/Technical Writing Intern
Sydney Watilla-Sprague General/Technical Writing Intern

Engineering

Chris Gilbertson, PhD, PE Associate Director
Pete Torola, PE Research Engineer
Zack Fredin, MS, PE Research Engineer
Ingrid Sandberg, MS, PE Research Engineer

About LTAP

The Local Technical Assistance Program (LTAP) is a nationwide effort funded by the Federal Highway Administration and individual state departments of transportation. The goal of the LTAP effort is to foster a safe, efficient, and environmentally sound surface transportation system by improving skills and increasing knowledge of the transportation workforce and decision makers.

Steering Committee

The LTAP Steering Committee makes recommendations on, and evaluations of, the activities of Michigan's LTAP.

Federal Highway Administration

Kurt E. Zachary, PE 517-702-1832
Local Program Engineer, FHWA

Michigan Department of Transportation

Bruce Kadzban, PE 517-335-2229
Local Agency Programs, MDOT

County Road Association of Michigan

Larry W. Brown, PE 616-813-5538 lbrown@alleganroads.org
Allegan County Road Commission

Sponsored by:



U.S. Department of Transportation
Federal Highway Administration



Michigan's
Local Technical
Assistance Program

The Center for Technology & Training (CTT) is a part of the Department of Civil, Environmental, and Geospatial Engineering at Michigan Technological University in Houghton, Michigan. The mission of the CTT is to develop technology and software, coordinate training and conduct research to support the agencies that manage public infrastructure. In support of this mission, the CTT houses Michigan's Local Technical Assistance Program, which is part of a national effort sponsored by the Federal Highway Administration to help local road agencies manage their roads and bridges. For more information, visit ctt.mtu.edu.



Michigan Technological University
Civil, Environmental, and
Geospatial Engineering

The Bridge

Bridging the gap between research & practice since 1986

Vol. 34, No. 4 – Fall 2022

- ▶ One Bold Paint: A Look at HRCSA One-coat System
- ▶ New Facilities, New Spaces, Unhindered Service
- ▶ Serving Michigan's Local Road-owning Agencies: The CTT's Newest Staff
- ▶ Technology Woven Into Asphalt: A Follow-up on a Michigan Fiber-reinforced Asphalt Paving Project



Michigan's Local Technical Assistance Program

Michigan Technological University
309 Dillman Hall
1400 Townsend Drive
Houghton, MI 49931-1295
906-487-2102

Non-Profit Organization
U.S. POSTAGE PAID
Permit No. 11
Houghton, Michigan
49931

Upcoming Events

REGISTER & MORE INFORMATION AT ctt.mtu.edu/training

2023 Using Thawcaster to Predict Seasonal Weight Restrictions
January 17

2023 MDOT LAP Webinars
New Section 106 Review Process – January 19

2023 Asphalt Paving Inspection Workshop
Virtual – January 24 & 25; Livonia – March 1; Grand Rapids – March 2

2023 MERL Training Webinars
Introduction to MERL Webinar – January 26; January 31
Intermediate MERL Training: Bid Utility Tool – February 15
Intermediate MERL Training: Local Job Manager – February 21

2023 TAMC Data Collection Training
IBR (webinar): February 1; April 18; June 27
PASER Class 1 (webinar): February 14; March 7; June 20; August 29
PASER Class 2: Webinar – February 15 & 16; Webinar – March 8 & 9; Livonia – March 29; Grand Rapids – March 30; Houghton – April 12; Gaylord – April 13; Webinar – June 21 & 22; Webinar – August 30 & 31

2023 Michigan County Engineers' Workshop
February 7-9 – Sault Ste. Marie

2023 Materials Acceptance Process Virtual Seminar
February 15; March 15; April 19

MARK YOUR CALENDAR: 2023 Michigan Bridge Week
March 14-16 – Muskegon

MARK YOUR CALENDAR: 2023 Michigan Highway Maintenance Conference
April 25-27 – Bay City

More training opportunities!

Visit ctt.mtu.edu/webinars-and-workshops to learn about other events offered by the Michigan LTAP/Center for Technology & Training

Engineering tech assist

We're here to help you!

- Tim Colling, PhD, PE – traffic safety & asset management
- Chris Gilbertson, PhD, PE – bridges/structures
- Pete Torola, PE – paved & unpaved road design, construction, maintenance
- Zack Fredin, PE – bridges/structures
- Ingrid Sandberg, PE – geotechnics

Learn more at ctt.mtu.edu
or contact ctt@mtu.edu

