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PIPELINE

MICHIGAN ASSOCIATION OF COUNTY DRAIN COMMISSIONERS
MANAGING MICHIGAN'S WATER RESOURCES SINCE 1899

2022 INNOVATION & EXCELLENCE AWARDS

NEW LIFE MEMBER HONORED

'GUINEA PIG'

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PRESIDENT'S MESSAGE

BRIAN WENDLING
Saginaw County Public Works Commissioner

Greetings fellow MACDC members,

I hope this writing finds everyone well. Here we are again, just around the corner of starting another construction season. Winter as a whole is now in the rearview mirror and we can start to focus our attention on needed maintenance issues and construction projects that seem to be growing in numbers each year. If the project numbers weren't increasing enough on their own, I suspect that many of us within agricultural communities will likely see an increase in requests driven by the recent spike in commodity prices. Good luck to all and best wishes for a productive construction season.

Following up on Winter Conference, I would like to take a moment to once again congratulate Brian Jonckeere, Livingston County Drain Commissioner, for his contributions to the MACDC over the years resulting in his Life Member Award. Thanks Brian for all you've done and continue to do.

Hopefully, all of those that were able to attend the conference found it to be enjoyable and educational. Obviously, the number one objective with the conference was to provide valuable educational topics and opportunities for all of our membership. Thank you to the members of the program committee for successfully providing quality presentations and topics. In addition to the presentations, I find there to be a tremendous amount of value in the networking opportunities. It's amazing what can be learned from one another in even a brief conversation.

Clearly, this conference wouldn't happen as it does without the huge support from our Associate Members. Thank you again to all who were in attendance and/or provided an exhibit, did a presentation, sponsored Tuesday dinner, donated (or purchased) at the silent auction, hosted a hospitality room or event, supported the euchre tournament, and anything else that I may have missed.

Your membership, participation, and support for the MACDC is greatly appreciated!!

Lastly, I want to follow up regarding the new committee tasked with creating a survey and collecting results regarding EGLE. The committee has been formed and is working on a much shorter schedule than I had first suggested. In short, the committee is making every effort to have results and recommendations to the Executive Board at the summer conference meeting. As mentioned at the business meeting, this will likely be a lengthy survey but your response is critical to the success of this task. Please take the necessary time to completely and accurately respond once you've received it.

It was a pleasure seeing everyone and I look forward to seeing you all again in July. Until then, enjoy your summer and be safe.

Brian Wendling
Saginaw County Public Works Commissioner
MACDC President

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2022 MACDC
INNOVATION & EXCELLENCE AWARDS

CLOVERDALE DRAIN

The Cloverdale Drain was a small tile, only a few hundred feet long, established in the early 1900's to drain and control water levels of the 4 lakes in the Cloverdale Chain-of-Lakes that were upstream of the Drain. No legal lake level existed on any of these four lakes and because of past drain petitions never moving forward due to their likely high-cost and difficulty in environmental permitting, a 10-inch tile was all that existed to drain and control the water levels in this several hundred-acre lake system.

The Barry County Drain Commissioner (BCDC) received a petition in the Spring 2018 because of excessive flooding and high water throughout the four lakes in the Cloverdale Chain-of-Lakes. The Drain project constructed a new box culvert outlet for Long Lake, which was immediately downstream of the Cloverdale Chain-of-Lakes and worked in conjunction with two separate Part 307 petitions by the County to establish legal lake levels for both Cloverdale and Long Lake, being immediately downstream of Cloverdale Lake.

The 10" tile drain was replaced with a new 24" outlet for Cloverdale Lake and the drain project also constructed a new lake level control structure for Cloverdale Lake, complete with a specialized metal alloy aquatic invasive species filter screen. To minimize maintenance of the filtered deep-water draw lake intake screen, an electrical 'air burst' system was also designed to clean the microscopic intake holes from getting clogged with aquatic vegetation and any filtered species, while still allowing it to pass 2,000 gpm downstream to Long Lake and ultimately to the Thornapple River.

In 2019, because of uncontrolled high lake levels and significant adjacent flooding around the lakes, working under emergency provisions in the Drain Code the BCDC partnered with MDOT to construct a new branch of the Cloverdale Drain to open a portion of state highway M-43, which had been closed from through traffic for nearly all of 2019 due to water over the road.

PROJECT TEAM:
Jim Dull, Barry County Drain Commissioner
Engineer: GEI Consultants
Contractors: Mead Bros. Excavating
Other Consultants & Additional Contributors:
Clark Hill PLC | GEI Consultants (Environmental & Ecological Services work) | Eng., Inc.
Progressive AE | Highpoint Community Bank | Northern Concrete Pipe
MDOT – Hydraulic Unit | DNR – Plainwell Office
EGLE Water Resources Division – Grand Rapids District Office & Lansing Staff

STERLING RELIEF DRAIN

Macomb County Public Works Commissioner's Office formed a design-build team to engineer and construct green infrastructure enhancements to improve water quality entering the Clinton River System by treating first flush rain events within the Sterling Relief Drain corridor.

Over 12,300 linear feet of the open channel drain was modified to create 10 bioretention cells to provide treatment time and filtration by native plants. Storm inlets were either disconnected from the 48-inch underdrain pipe and daylighted or restricted to force the first flush rain events to the surface into a newly created treatment cell.

Close to 160,650 perennial plugs, 1,400 shrubs, and over 500 trees were planted, creating 40 acres of habitat with 15 acres of open channel bottom and 25 acres of riparian tree canopy and low-profile prairie. A retrofit of this magnitude is the first to be completed in the highly urbanized areas of southeast Michigan.

PROJECT TEAM:
Candice S. Miller, Macomb County Public Works Commissioner
Engineer: Hubbell, Roth & Clark
Contractor: T.R. Pieprzak Company
Other Consultants: Jeff Bednar, Environmental Resources Manager, MCPWO

HONORABLE MENTION
BURKE DRAIN | LAPEER COUNTY

The Burke Drain became a legally established drain by petition in 2019. A low area in a residential neighborhood became inundated by an unknown cause. A solution was not found by either the Road Commission or Elba Township, so the Lapeer County Drain Commissioner was petitioned by the Township to establish a drain. The key design aspect of the project was to establish a permanent water elevation of the pond that would prevent damage to the surrounding properties as well as result in little to no loss of wetland. The outlet for the pond consists of a level control riser structure, a pump station, infiltration area for the pump discharge and an outlet pipe with flow spreader for the infiltration discharge. The design of the system did not require a submersible pump but rather allowed for a surface mounted back up pump. Once the pump is on, the water will then be dissipated by the infiltration area. The infiltration area consists of a series of 15" perforated pipes, 6A natural stone & CL II granular material. Should the infiltration area become overloaded, the water will flow out to grade through a 12" outlet fitted with a flow spreader component.

PROJECT TEAM:
Joe Suma, Lapeer County Drain Commissioner
Engineer: BMJ Engineers & Surveyors, Inc.
Contractor: Raymond Excavating Company
Other Consultants: King & MacGregor, Northern Concrete Pipe, Inc.

HONORABLE MENTION
WET WEATHER EVENTS IN THE COUNTY DRAINS IMPACTING THE SANITARY SEWER COLLECTION SYSTEM | GENESEE COUNTY

The Genesee County sanitary collection experiences significant infiltration and inflow problems based on the wet weather conditions in the adjacent county drains. The County's NPDES permit has a requirement to determine what wet weather events result in flooding the sanitary sewer collection system. A study was initiated to address the permit needs and evaluated 1,184 sanitary manhole structures along 26 drains. The study found nearly 28% of the manholes are impacted by storm events smaller than a 5-year recurrence period.

PROJECT TEAM:
Jeff Wright, Genesee County Drain Commissioner
Engineer: Tetra Tech

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- Advanced Robotic Sewer Cutter
- Lead Water line exploration, identifications, and replacement
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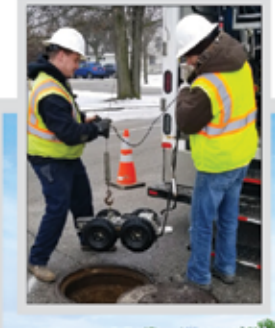

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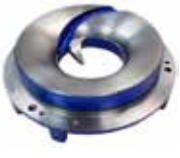

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NEW LIFE MEMBER HONORED

Brian Jonckheere Receives MACDC's Prestigious Award

A highlight of the MACDC Winter Conference this February was awarding Brian Jonckheere (Livingston County Drain Commissioner) Lifetime Membership in recognition of his outstanding service in the advancement of the purposes of the association and the role of the office of the County Drain Commissioner. This award is the MACDC's most prestigious award, and is given to those who are nominated and approved by the association's executive board. It is awarded in grateful appreciation to individuals who have shown dedicated leadership and provided services to the association and its membership.

Brian Jonckheere, Livingston County Drain Commissioner (left) with Evan Pratt (right), Washtenaw County Water Resources Commissioner

Brian has served Livingston County residents and MACDC for over 25 years since appointment in 1996. Over the years he has served MACDC as President, 1st and 2nd Vice President, Treasurer, Legislative Committee Chair and numerous other committees and special assignments. Growing up on a working farm and as an active 4-H member, one of Brian's current roles is with MACDC's Farm Bureau Liaison committee.

Brian has a degree in fisheries biology and has served his County well focusing on both water quantity and water quality. In addition to the usual duties of keeping the water moving in drains and working with lake level districts, his office also provides sewer service to some residents, including taking jurisdiction of over a dozen failed privately owned small sewage treatment systems. One of Brian's proudest achievements was construction (and subsequent expansion) of a septage receiving station on US-23 in Brighton AND passage of a County ordinance requiring proper septage hauling and disposal to protect our waterways and lakes. This work has helped fulfill his desire to be No. 1 in the No. 2 business! He has also led a waste diversion program that has increased service over the years, taking in over 1,000,000 pounds of household hazardous waste, 450,000 pounds of batteries and 1,400,000 pounds of e-waste during his tenure.

Brian is also engaged in his community, receiving the Citizen of the Year award from the Howell Chamber of Commerce in 2015 for extensive support of community programs, festivals, and initiatives related and unrelated to his role as Drain Commissioner. Brian is very approachable and always willing to help figure out the best way to solve a challenging problem. Livingston County residents receive A+ service due to Brian's curiosity, empathy and extensive technical background that mixes well with the common sense and frugality found on most farms.

‘GUINEA PIG’

Allegan County's Selkirk Lake Drain

By: Brian J. Cenci, P.E., GEI Consultants

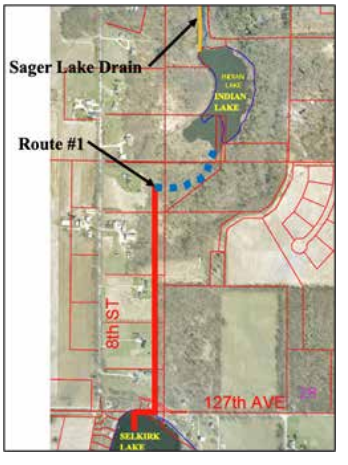
The Selkirk Lake Drain project was a precursor to many, much more recent drain projects that involved exceedingly high and uncontrolled lake levels in southwest lower Michigan. Now, nearly 3 years after construction, the Selkirk Lake Drain has resolved the flooding issues, residents now have a stable, controlled lake height and the AIS filtering and monitoring protocols are proving that you can solve one huge problem without creating new ones.

Selkirk Lake is located in Wayland Township in Allegan County, just over a mile away from US-131 and the noticeable Gun Lake Casino. The Lake is approximately 100 acres in size, with nearly 1,250 acre-feet of volume within its 2.3 miles of lake shoreline. The Lake has a maximum depth of 39 feet and an average depth of approximately 13.5 feet. There are approximately 150 lakefront properties, including two campgrounds and a DNR boat launch. Although properties around the lake are largely developed, no public system for sanitary sewer or drinking water services the area, relying instead on septic tanks and drain fields to provide sanitation.

In the summer of 2011, residents on the Selkirk Lake waterfront experienced devastating flooding, causing lakefront homes to become uninhabitable. They filed an application and a petition with the Allegan County Drain Commissioner (ACDC) for the establishment and construction of a new drain, to control water levels that had risen four to five feet higher than normal on Selkirk Lake. In December of 2011 a Board of Determination found the drain petition necessary.

The Selkirk Lake Drain Drainage District encompasses almost 1,500 acres in Wayland Township (approximately 1,450 acres) and in Martin Township (just under 50 acres). The initial engineering work identified three possible routes for a new gravity drain outlet from Selkirk Lake to a downstream waterbody. Other solutions proposed infiltration to inject the stormwater into an underground leaching system; however, a suitable area to receive the pumped stormwater was not available.

Preliminary design indicated that there were three initial outlet routes and those were presented at the first Scope Meeting in December 2011. Routes were carefully compared, as the plan would require years of easement acquisition, permitting and design. In the end, the engineer recommended, and the attendees agreed, that the shortest and deepest option involving the fewest properties and the greatest drop in elevation was preferred. A lake level control structure would be installed on the north end of Selkirk Lake, from which a new 18-inch storm sewer pipe, buried between 40 and 48 feet deep, would transport stormwater approximately 2,500 feet north through four large rural residential properties. The pipe would emerge from a large ravine into a 40-acre wetland surrounding Indian Lake. The discharge from this overflow pipe would enter one of the many cold groundwater seeps and waterways surrounding Indian Lake. This option was also amenable because the Sager Lake Drain, the county drain for the discharge area, could accommodate the additional stormwater with minimal water level rise in the wetlands and Indian Lake. However, before committing to this route, two critical meetings were needed to make other key stakeholders aware of the plan.



Route #1 was the selected option for construction of an enclosed 18-inch outlet drain that would take high-water levels from Selkirk Lake by using a bottom-draw lake level control structure and discharge the stormwater into an outfall aeration area, which flows into a stilling basin and then once the water exceeds the discharge height within that stilling basin it flows into the wetland surrounding Indian Lake

The first meeting was with the Match-E-Be-Nash-She-Wish Band of Pottawatomi Indians, Gun Lake Tribe (the Tribe). The Drain Commissioner and Eng. requested this meeting even prior to meeting with affected property owners or the Michigan Department of Environment, Great Lakes, and Energy (now EGLE formerly DEQ), knowing that the Tribe owned designated tribal lands immediately adjacent to the proposed work, and the Tribe’s Bradley Mission Cemetery was less than 500 feet away. The proposed drain route involved no construction work on any tribal lands, but some of the stormwater

from the overflow pipe into the ravine and surrounding wetland could flow through some of the wetlands on the Tribe's property, over which ACDC had no jurisdiction to obtain an easement. The meeting took place and the Tribe followed the meeting with a letter of objection to the DEQ regarding the project; however, they did note that if the route of the drain discharge was extended "100 feet further to the north" that "it doesn't appear to the Tribe that this would adversely impact the project." Another letter from the Tribe also raised several legal concerns associated with notification, existing Memoranda of Understanding, and agreements with the State of Michigan. The Tribe felt that this new drain project violated those agreements. Hoping to resolve the conflict, the decision was made to move the outlet of the drain further north, as the Tribe suggested.

Shortly after the Tribal Council Meeting, the next critical meeting was with the DEQ, which included discussion about the Tribe's position. The DEQ agreed with extending the selected route.

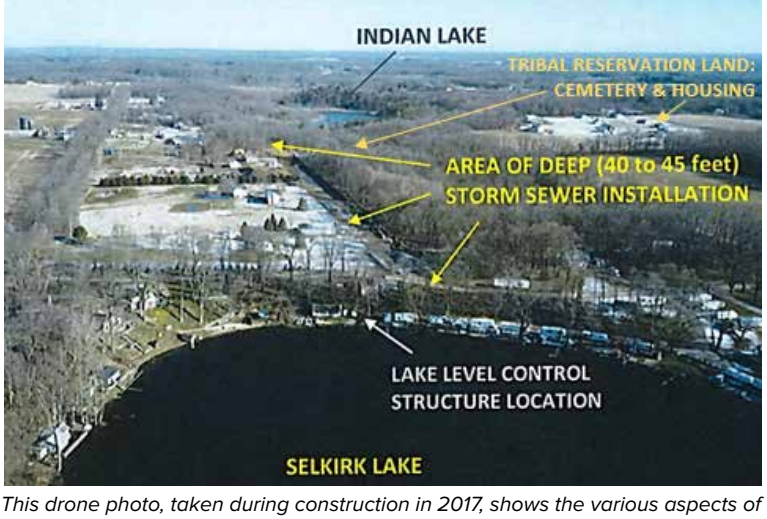
Over the next four years Eng. obtained easements, starting on Selkirk Lake and the location of the proposed control structure. The engineer negotiated each easement one at a time, working from the lake toward the outlet. This procedure allowed the ACDC to secure the route of the drain progressively, so no compensation was wasted by an unexpected change in design. Ultimately, twelve easements were obtained, including six for the pipe (100 to 110 feet wide easements through the 40-48 feet deep sections of storm sewer installation), and several for residents north of 127th Avenue, themselves unaffected by the Selkirk Lake flooding. Also, six flowage and flooding easements around the west side of Indian Lake were obtained, allowing for a contingency plan to construct the relief pipe around the west side of Indian Lake directly into the Sager Lake Drain.

From 2012 to 2016 the ACDC and Eng. worked in close communication with the Selkirk Lake Association, completed the drain design, obtained water quality information for the DEQ Permit application, and analyzed the lake height and local rainfall for 18 months. In July of 2016, all the easements had been obtained as well as significant testing and analysis of the two waterbodies to be connected, to provide all the information to the DEQ for a complete review of the project. A DEQ Permit Application was submitted in July 2016.

Subsequently, a second Scope Meeting was held in July of 2016, attended by nearly 1/3 of the landowners in the District. The engineer presented the complete project and described the remaining tasks to begin construction late Fall 2016. Eng. then finalized the bid and construction plans. On July 27, 2016 the DEQ determined that the Permit Application was "Administratively Complete" and issued a public notice for the proposed project on August 2, 2016. This designation means the applicant has collected and provided all pertinent quantitative data necessary for the DEQ to review the Permit Application and render a formal decision. Considering the positive feedback from the residents at the second Scope Meeting and the vast information supplied in the DEQ Permit Application, the project was released for public notice and, in an effort to capitalize on the winter construction season, the construction plans were released for bid during the same time period, the beginning of August 2016.

At the end of August of 2016, ACDC received construction bids on the project, and E. T. MacKenzie Co. from Grand Ledge, MI submitted the low bid of $1,141,880.35. On August 31, 2016 the ACDC held a Day of Review of Apportionments where a total project cost to be assessed of $1,790,000 was presented to landowners in the Drainage District.

The concurrent public notice period for the DEQ Permit Application was designed to allow landowners who may be affected by the proposed work to comment to the DEQ on the project. Although the DEQ received several positive comments and letters in favor of the project, they received one letter of strong



This drone photo, taken during construction in 2017, shows the various aspects of work relative to the two lakes and the tribal owned properties.

objection to the project, from the Gun Lake Tribe, citing some of the same concerns as in their objection letter of 2012. As a result of that objection, the engineer received a call from the DEQ saying, "We can't issue you a permit until you resolve all of the Tribe's concerns first." Their concerns that affected obtaining a DEQ Permit were as follows:

- Archaeological concerns that construction could uncover or disturb Native American artifacts or burial remains. This concern was based on the width of construction at the surface and that work would take place adjacent to Tribal Lands and the Bradley Cemetery, an ancestral burial ground.
- Water quality concerns that the greater development around Selkirk Lake would discharge “low quality” lake water into Indian Lake, a private lake that the Tribe considered to be "pristine."
- Concerns over the transfer of aquatic invasive species, Eurasian watermilfoil (EWM) and curly leaf pondweed (CLP), both of which had been treated chemically in Selkirk Lake for several years. Neither the EWM nor the CLP had been detected in Indian Lake or in the other lakes downstream of Indian Lake. Purple loosestrife was also a potential concern, and the possible transfer of "unknown" species.

In early September 2016 Eng. performed a site walk with representatives of the DEQ who then requested significant additional information, including testing, water sampling and aquatic vegetation analysis, before a permit could be issued. Considering the volume of information requested, the DEQ would not likely issue a permit until spring of 2017. Having just cleared the appeal period from the Day of Review of Apportionments and with a favorable construction contract price secured, the ACDC needed to decide whether to proceed. Winter construction was planned, and Selkirk Lake residents were promised that no work would take place between Memorial Day and Labor Day in any given construction season. Waiting another year to rebid the project after receiving the DEQ Permit would be risky. The ACDC decided to keep the current Computation of Costs and signed apportionments, and proceeded with the project by convincing the contractor to hold their labor costs to bid prices and cap material

cost increases during permit review. A modified Notice of Award was issued with subsequent extensions so that E. T. MacKenzie was bound to their bid throughout the process.

Since the end of the allowable time period for fall vegetation sampling was near, ACDC contracted with Progressive AE to begin the sampling, testing and vegetative survey work at the end of September. GEI Consultants was brought in to evaluate the outfall aeration area and stilling basin and to develop plans for wetland restoration to reduce the impact on the wetlands surrounding Indian Lake. The results from the initial water sampling work that fall showed that the water quality of Selkirk Lake was actually better overall than that of Indian Lake. Also, aquatic vegetation surveys showed that both lakes contained Purple loosestrife, no Curly-leafed pondweed (CLP) exists in Selkirk Lake, and only a small portion of Eurasian watermilfoil (EWM) was found on the south end of Selkirk Lake. However, even though these initial tests and survey work were positive, the DEQ still requested more sampling and testing in the spring of 2017.

In response to another DEQ request, in October 2016 the ACDC and the engineer put together a thorough proposal aimed at mediating the Tribe's archaeological concerns about the excavation. This work would be added to the established project cost, reducing the contingency for construction. The proposal was presented to the Tribe as a measure of good faith, but they remained unsatisfied. Eng. worked with the State Archaeologist, Dr. Dean Anderson, for preconstruction preparation and a plan should artifacts be found during the construction site survey. He reviewed the site survey work proposed and confirmed that we were proposing a standard survey technique to the level of a licensed archaeologist, including a thorough examination of the entire upland area that would be disturbed. Eng. elected to work with Misty Jackson, PhD of Arbre Croche Cultural Resources of Leslie, MI, and ACDC agreed to keep Dr. Jackson on retainer throughout construction, should any artifacts or burial remains be uncovered. The proposal included sensitivity training for anyone who would be on-site during construction (employees from E.T. MacKenzie Co., Eng., and ACDC) regarding Native Americans, and a detailed protocol if any Native American artifact was discovered during the construction. The Tribe reviewed the proposal again, but continued to object to all aspects of the project.

The DEQ consulted the Environmental Protection Agency (EPA) to review all Permit materials and Tribal concerns and provide written public comment regarding the Permit Application. This EPA review took 90 days, and when a formal response was received, it included no resolution other than to tell the DEQ that if the applicant is not on Tribal lands, is following the process that would "avoid, minimize or mitigate" any wetland impacts, and is resolving the invasive species transfer concern to the DEQ's satisfaction, the EPA would have no objection to a permit being issued.

In the spring of 2017, Progressive AE performed the remaining water sampling and aquatic vegetation surveys of Selkirk Lake and Indian Lake and published their final report in May 2017. The water sampling indicated that Selkirk Lake had better overall water quality for the majority of the testing parameters required by the DEQ. However, the results from the aquatic vegetation surveys showed that both EWM and CLP were present within Selkirk Lake and not in Indian Lake. Since the only locations where these invasive species were found in Selkirk Lake were on the opposite end from the proposed intake location for the drain, Eng. had begun working with representatives of the DEQ and DNR to develop a lake level control and intake structure that would limit the transfer of these and any potential invasive species through the newly constructed drain. Eng. performed significant research on both EWM and CLP to learn how transfer commonly take place and what intake structure design would prevent it. Although limiting the transfer of invasive species from one waterbody to another should not be unusual, no manufacturer made a specific intake or control structure designed to address it. Ultimately, the engineers, working with a metal fabricator, the DEQ, and the DNR designed a completely unique intake screen and control structure. (In 2018 and 2019 the DNR even referred other consulting engineers to this design for their similar projects, pumping from one lake to another.)

The intake screen had a large screen structure that would be welded together using #5 sized rebar. Interlaced between the rebar would be #6

sized stainless steel mesh screen (approximately 0.13-inch openings) that would sit over four separate 8-inch PVC elbow sections, with 18 inches on the end of each, and with smaller #16 stainless steel mesh screen (approximately 0.05 inch) openings. The larger outer screen would sit over the top of the four smaller elbow screens and catch any potential plant fragments or seeds (the most likely way for EWM and CLP transfer). Built into the outer screen were metal hooks on top, so that it could be lifted off completely and sit on top of the PVC elbow via metal brackets to hold vertical rebar in place at the end of the intake, approximately 95 feet into the lake and 10 feet deep, to accommodate maintenance of the four smaller inner screens.

Other possibilities for the discharge water to move undesirable vegetation to the Indian Lake area were also mitigated. Eng. designed an outfall aeration channel with several waterfall drops, j-hooks and cross vanes that led to a stilling basin at the bottom end. The channel was designed to aerate the water traveling through the enclosed pipe from Selkirk Lake and allow for further settlement of any invasive plant fragments, should any get through the screen and into the pipe. At the end of the aeriation channel, a settling basin was designed. The settling basin would provide another opportunity for aquatic vegetation to settle out prior to discharging into the Indian Lake area. The design also directed the water from the settling basin to be uniformly discharged overland into the wetland, and a flowage easement was obtained to allow the water to spread out in the wetland rather than as a concentrated watercourse to induce more settling. This design was used because CLP is considered a "deep water" plant and needs at least 1 to 2 feet of permanent water cover to establish and grow. Therefore, establishment in the few inches of water present in the wetland between the settling basin and Indian Lake would be difficult. Eng. submitted the final permit materials and application on July 14, 2017. By law, the DEQ had until July 27 to issue a permit (once a permit application is considered "administratively complete" a decision must follow within 365 days).

One caveat arose - the permit would be considered "conditional" until a maintenance agreement could be drafted and approved by all parties. The need for a maintenance agreement had not been mentioned up to now. So, while the ACDC began to secure financing on the 1.79-million dollar project, Eng. and the DEQ worked out a maintenance agreement to monitor and maintain the intake screens, outfall aeration area, stilling basin, and for Indian Lake. The monitoring plan was different for each of the areas and involved different time periods and extents for which monitoring would be required (some were annual and others were monthly). Results from this monitoring and inspection work would be submitted to the DEQ annually. Then a maintenance plan was also put in place for cleaning the intake screens. The maintenance agreement was completed and signed by both parties in October 2017 and the plans modified to account for any changes since the bid documents issued the prior year. The DEQ issued the Permit on October 19, 2017.

Construction started in December 2017. The contractor finished installation of the deep storm sewer (averaging about 40 to 50 feet a day through the very deep areas) in April of 2018 and then installed some other remaining items before temporarily stopping work prior to Memorial Day, as required by the Contract. In August of 2018 the outfall aeration channel and the settling basin were constructed. After Labor Day of 2018 the Contractor crossed 127th Avenue to perform a deep bore-and-jack from the south side of 127th Avenue to the location of the lake level control structure. The intake pipe and lake level control structure were installed in October.

In October of 2018 a minor permit revision was submitted to the DEQ regarding the intake location and modification of the intake screen to allow the screening to take place within the lake level control structure. After determining that the screen structure would weigh nearly 1,500 lbs., it was apparent that the structure's location and weight made adhering to the

A 550 ft. long outfall aeration channel (picture top left, looking north), with J hooks and cross vanes, constructed to help increase the oxygen levels by aerating the discharge water, spills out into a stilling basin (picture on the right, looking southwest). Once that overflows, the runoff uniformly discharges through the emergent wetland, through no discernable path, until it reaches Indian Lake approximately 700 ft. away

Maintenance Agreement nearly unfeasible, so Eng. worked with the DEQ Kalamazoo District staff and DNR Fisheries Biologist Matt Diana to develop a more practical screening system. They also agreed that a deep "bottom draw" for the intake pipe was no longer critical, since the overflow water discharging to the wetland around Indian Lake would have substantial contact time with extremely cold groundwater seeps flowing through the 40-acre wetland. A revised intake pipe location was approved that would be shallower (about 5 feet deep) and less than half the original distance into the lake. The DEQ had to allow their divisions and the EPA to comment on this change, but the minor permit revision was finally approved on April 19, 2019.

> "We're working on something that is 'off the charts,' that doesn't even anticipate storm sewer ever being constructed this deep."
>
> – John Washabaugh, Northern Concrete Pipe

Since construction was completed at the beginning of 2019, the drainage system has worked well, helping to control the previously high lake levels. In the spring months of both 2019 and 2020, lake levels rose a maximum of approximately 1-foot over the lake level control intake structures' 'overflow' elevation. Both years, significant regular maintenance was required on the intake screen in order to keep the outfall pipe from the structure as close to free flowing as possible. In 2020, a breakout of the aquatic invasive species, Starry stonewart Nitellopsis obtuse, was reported and subsequently confirmed to exist in the southern portions of Selkirk Lake (note: the lake level control structure is on the north end of the Lake). Required monthly monitoring between April and September of the outfall aeration channel, the wetland surrounding Indian Lake and of Indian Lake in 2020 and in 2021 reported no downstream presence of the Starry stonewart, proving that the intake screening and discharge location relative to adjacent waterbodies seem to be working as designed.

UNIQUE CHALLENGES AND UNIQUE SOLUTIONS

PUBLIC INVOLVEMENT AND KEEPING THE PUBLIC INFORMED: Along with yearly mailings and attendance of the engineer at regular Lake Association meetings, two separate Scope Meetings with residents were held at key milestones of the project. The first, in 2011, was done to give key input into the initial design and to determine what route would be used to provide a positive outlet for the Drain. The second was held in 2016 to give residents a final say into the design and to review details of the proposed construction and approximate assessment costs before the project was finally bid.

INCREASE IN DISSOLVED OXYGEN LEVELS IN DISCHARGE FROM SELKIRK LAKE: Discharge from Selkirk Lake travels ½ mile in an enclosed pipe with no sunlight and minimal oxygenation. The deep-water draw from Selkirk Lake, along with the outfall aeration area, were both designed to improve oxygen levels in the discharge from Selkirk Lake's overflow water. Additionally, the stilling basin and aeration channel create their own ecosystems, mixing with many of the cold-water seeps that feed this relatively cold wetland system. Based on the sampling and analysis of these design improvements, dissolved oxygen (DO) levels are expected to be near, if not exceed, statewide standards for a cold-water trout stream (7 mg/L), which will help with maintaining similar plant species in the wetland around Indian Lake. Also, although not required, along the outside of the aeration channel various habitat mitigation structures were installed in November 2018 to provide structure and habitat for various aquatic organisms that may have been impacted by the aeriation outfall channel.

SPECIALLY DESIGNED CLASS V REINFORCED CONCRETE PIPE FOR DEEP BURIAL DEPTHS: What do you do when the depth of your pipe exceeds all the standard fill depths in any design manual? Burial depths for the storm sewer outlet from Selkirk Lake being 40 to 48 feet for nearly a mile, Northern Concrete Pipe was able to provide a special design for the 18-inch pipe: a custom steel reinforcing design that exceeded Class V standards. With the new design, the wall thickness was 1.4" greater than normal Class V wall and the steel area was increased by 57%. The compressive strength of the concrete was 38% stronger than the compressive strength of the standard design. Three Edge Bearing tests exceeded the Class V design loads by 20% in just three days, with the expectation that the pipe will continue to get stronger as time goes on. After installation of each section of storm sewer, the previous portion of storm sewer was video inspected for cracking or deformation, so the contractor and pipe supplier could correct any deficiencies in the pipe prior to continuing construction.

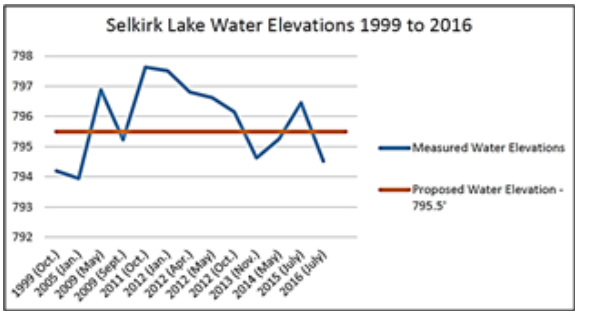
LAKE LEVEL CONTROL AND INTAKE STRUCTURE TO PREVENT INVASIVE SPECIES TRANSFER: As discussed, the screened intake structure, with varying levels of screens, was originally proposed to extend farther into the lake; however, after review with the DEQ and DNR, for maintenance purposes long-term, the screening would be more effective within the control structure, rather than at the intake pipe. Value engineering with the fabricator and the DEQ and DNR resulted in a varying-sized screen cabinet installed on the downstream 18-inch storm sewer pipe. Throughout 2019, 2020 and 2021, monthly monitoring of the screen cabinet necessitated cleaning of the screens in the early Summer and late Fall due to the buildup of algae and plant material, thus limiting downstream flow.

PERMANENT MAINTENANCE AND MONITORING AGREEMENT WITH THE DEQ: After a conditional Permit from the DEQ was granted, work began on a long-term maintenance and monitoring agreement, particularly aimed at monitoring the screens in the control structure. This agreement requires the Drainage District, in perpetuity, to provide specific monitoring reports to the DEQ during certain months of each year, and a protocol in the event that invasive species are ever found downstream, in, or around Indian Lake.

COLLABORATION WITH CONTRACTORS AND SUPPLIERS IN THE DESIGN, EASEMENT ACQUISITION AND PERMITTING PHASES: Since several essential items of design were custom - not available from a supplier (like the screened intake structure designed for the bottom of the lake), it was essential to confer with underground construction contractors, manufacturers and suppliers to design how these items could be constructed. One example was the specific trench detail for the RCP, and in fact, several other details for different pipe materials were developed this way. Their expertise not only provided insight into the construction and installation of the storm sewer, but how to access and store excavation materials as well. This advice aided engineering and design, and helped the engineers understand where and what dimensions the construction and permanent easements needed to be.

DEVELOPING A "REAL-TIME" MODEL OF THE RELATIONSHIP BETWEEN RAINFALL EVENTS AND THE RISE IN LAKE LEVEL OF SELKIRK LAKE: Arguably the most pertinent information needed to define the scope of the project was the relationship between rain events and the lake level rise and fall in Selkirk Lake, including the time required for the levels to subside. The 18-inch storm sewer size was determined based on the two years' worth of rainfall and lake height data. After several iterations, the design of the system and selection size for the outlet pipe were based on the water in the lake being exactly at the determined water control level; then, if a 10-year, 24-hour rainfall event occurred, the smallest pipe size that would lower the lake level back to the high-water level in 48 hours was calculated.

METHOD FOR DETERMINING THE PAST "NORMAL" LAKE HEIGHT: The method for determining the "high water level" in the lake before discharges would occur was unique. Since the purpose was to control flooding from high lake levels, Eng. was not aiming for the lake level favorable to the most number of lakefront residents. In order to understand what the Selkirk Lake height was years ago before flooding was a concern, Eng. examined past lake height data shown on recorded survey information from the Register of Deeds and recorded Plats around the lake, which showed lake heights. Then, Eng. surveyors shot elevations of items on those surveys or Plats in order to interpolate the lake elevation relative to the current NAVD 88 datum used.



This graph shows the various lake heights recorded over time. Please note that anything prior to October 2011 had to have the elevation determined using the method described above.

METHOD FOR DETERMINING THE PROPOSED CONTROLLING ELEVATION OF THE LAKE: Once Eng. calculated the average historical lake height, they needed to develop a way to explain to residents what the proposed elevation would mean for their properties. Eng. decided to put eight different proposed maximum lake height markers throughout the lake over a two year period. Then, after several months, the Lake Association, who did its own internal "polling" by email list and Facebook, provided comments back to the engineer. Originally the elevation proposed for the high-water level was 974.75' for 2013. In the winter of 2013, residents asked to have it raised 975.25' and for most of 2013 that

was the elevation being analyzed. Ultimately, the lake residents asked to raise it approximately three inches higher; thus, the final proposed and permitted maximum lake height elevation was 975.50'.

ALTERING NATURAL WATERSHEDS: When the original DEQ permit application was submitted in 2014, one issue raised by the DEQ's Hydrology Unit concerned the impact of manually altering an existing sub-watershed to discharge to a different sub-watershed. Selkirk Lake was located in the Miller Creek watershed; would the groundwater be reduced and contribute down-gradient to Miller Creek? Would the capacity of the Rabbit River watershed accommodate the additional water? Eng. located previous studies for Miller Creek, Gun River and Rabbit River showing significantly more capacity and storage available in the Rabbit River watershed, much of it due to the wetland mitigation bank of the Bear Swamp Drain within the Rabbit River watershed. Eng. provided various analyses of major road crossings for each receiving waterbody showing that no upsizing of road crossings would be needed.

"...in nearly 40 years in the construction business, this project is easily one of the hardest, if not the most difficult one I've encountered, in terms of bidding it and especially in terms of its construction."

-Scott Ammarman, Project Manager, E.T. MacKenzie Co.

CONSTRUCTION *(including notes by the Contractor's Project Manager)*: One thing that made this project so complex was the uniqueness of so many bid items. We couldn't just go to the latest MDOT Bid Unit Prices to set up our bid costs. An example is constructing and installing the one-of-a-kind lake level control and intake structure. The overall depth of the project coupled with the width of the construction easements required some complicated techniques and logistics to complete the work safely and timely. The maintenance drive to Selkirk Lake was extremely narrow and a residence to the north could have been impacted by conventional open cut construction methods. To reduce the risk, this section of the work was completed utilizing bore and jack construction. The depth of the main 18-inch storm sewer required an average cut depth of nearly 33 feet to utilize our 200,000-pound Caterpillar 390 excavator, the largest conventional excavator Caterpillar produces and the largest one in the State of Michigan. The excavation required us to bench down the entire easement width (75 to 110 feet) between 10 to 15 feet with an excavator, to use the CAT 390 for the deep pipe excavation. Several CAT 730 off road trucks transported the overburden to and from the benched excavation. Double-stacked trench boxes contained the dig and provided safety for the entire crew.

BIDDING *(including notes by the contractor's Project Manager)*: The bid process specified no specific pipe material for any of the deep pipe sections but rather pipe strength standards were specified based on fill heights over the top for the extreme burial depth of the storm sewer pipe for the majority of the project. Additionally, the method of construction was not specified (open cut, bore and jack, directional drill) to further allow bidders to approach the method of construction from different perspectives and increase the number of bids that would be received for the work. This method of bidding allowed for better contract prices by bringing in more competitive bids.

VALUE ENGINEERING AFTER BID HOLD: Prior to construction of the Selkirk Lake Drain, several opportunities arose to make cost effective

changes to the construction plans. Many of these changes allowed a savings to the overall construction cost and, more importantly, resulted in a better finished product (i.e. revised Lake Level Intake and Control Structure).

"FIRSTS" FOR A DRAIN PROJECT:

- Overall the deepest open construction excavation for storm sewer pipe ever installed in Michigan for the length of this project (nearly ½ mile, confirmed by Northern Concrete Pipe Co.)
- The first Part 301/303 DEQ Permit Application to be obtained with a standing objection by a Native American Tribe (confirmed by Amy Lounds - DEQ)
- The first Part 301/303 DEQ Permit Application to be sent to the EPA under the original Memorandum of Understanding between the DEQ and EPA because of the involvement of a Native American Tribal objection (confirmed by Kim Fish - DEQ)
- The first Drain project to essentially establish a "high" lake level without going through the Court system under Part 307 to establish a legal lake level (confirmed by Kameron Jordan- DEQ)
- The first Drain project to ever perform an archaeological site survey prior to construction taking place.

Author's Note: The Selkirk Lake Drain project received the 2020 Innovation & Excellence Award from the MACDC. It was the first type of project (started in 2011) that involved a 'kettle' lake with uncontrolled high lake levels associated with increased groundwater levels in SW Michigan; a problem that has become much more frequent for County Drain offices in SW Michigan since 2017. No Pipeline article regarding the project was ever done after receiving the award.

Water level control structures were installed as a part of the Beechtree Drain Improvement Project to allow the OCWRC to efficiently control storm water storage and flow along the drain.

BEECHTREE DRAIN: CONNECTING THE PIECES

Flooding and development ignite spark for consolidation and solving decades-old issues

By: Erin M. Heitzenrater, Spicer Group, Inc.

In the northwestern corner of Ottawa County, located in Grand Haven Township, the Beechtree Drain services a watershed of 590 acres. Originally established in 1884, it grew into a mixture of open drain and enclosed storm sewer as the agriculture land around it was developed into residential, industrial, and commercial land uses.

The Beechtree Drain begins just south of the Grand Haven Township Hall on Ferris Street. It proceeds southwest across US-31, then travels south for one mile along 168th Avenue before turning east on Warner Street. It then proceeds down Warner Street back to US-31, where it provides drainage for the highway.

Located just over a mile from Lake Michigan, the drain conveys water to the Van Doorne Drain, which outlets to the Grand River. In recent years, the area has had high groundwater levels. After storm events, water would pond in low areas within the watershed because of limited infiltration caused by high groundwater. When combined with significant runoff from intense storms, flooding occurred throughout the watershed damaging homes and businesses.

These ponding areas did not have a connection to the drain and could not be conveyed downstream in a timely manner. This resulted in standing water in backyards, along roadways, and on the nearby golf course. Stagnant water sat for weeks resulting in unsightly algae growth and mosquito breeding areas.

One significant change within the watershed in recent years occurred on a golf course located on the western side of the drain. Originally opened in 1965, the Grand Haven Golf Club closed in 2018, was purchased by the American Dunes Golf Club, and then underwent a major redesign before re-opening in the spring of 2021. This redesign offered the opportunity to add infrastructure to connect golf course ponds to the storm sewer system.

Looking North at the Beechtree Drain along 168th Ave. in Grand Haven Township after the historic May 2020 storms. The OCWRC used diesel pumps and sandbags along the drain to mitigate flooding.

Also, within the Beechtree Drain watershed, three smaller subdivision storm sewer drains were constructed over the years – the Lincoln West Subdivision Drain, the Golfview Subdivision Drain, and the Sanctuary Subdivision Drain. Once constructed, these drains were transferred to the Ottawa County Water Resources Commissioner (OCWRC) to maintain but infrastructure was not put into place at the time of their development to connect the subdivision drains to the watershed's overall stormwater system.

"This was an interesting project," Spicer Group Project Manager Paul Forton, P.E., said. "Having four separate drains within the watershed complicated managing the water as an overall system. We knew we couldn't solve the problem without combining those drains and extending the infrastructure."

In August of 2019, the OCWRC received a petition from Grand Haven Charter Township to consolidate the drains and alleviate the localized flooding issues. The OCWRC hired Spicer Group to assist with the inspection of the drain, developing a solution, and designing the improvements.

Storm sewer pipe about to be directionally drilled under Retreat Dr. adjacent to American Dunes Golf Course. This new infrastructure connected previously separated portions of the Beechtree Drain.

With the history of localized flooding and understanding that no construction work would take place prior to spring rains, the OCWRC and Spicer Group mobilized four temporary diesel pumps to manage excess water throughout the watershed in early 2020. Excess water was pumped slowly downstream to decrease the threat to local homes and businesses and provide additional storm water storage volume within the watershed.

On May 17 and 18 of 2020, Grand Haven Charter Township, like many areas of Michigan, was hit with a 50-to-100-year storm resulting in widespread flooding. The temporary pumps were instrumental in managing the excess storm water that was received, mitigating any flooding and damage. A state of emergency was declared in Ottawa County and with flooding threats not only known, but proven, the OCWRC and Spicer Group expanded the design of the Beechtree Drain improvement project to improve the entire Beechtree Drain, not just the specific area called out within the petition.

“Without expanding this project to include larger improvements to the watershed, Grand

The OCWRC mobilized 4 diesel pumps along the drain to be used prior to and during construction to manage storm water levels within the watershed.

Haven Township residents would continue to have flooding issues," Joe Bush, the Ottawa County Water Resources Commissioner, said. "By working with the American Dunes Golf Course and other landowners, we were able to improve the storage volume and by expanding the project design to we can now control the water level in local ponds."

The project was expanded into a multi-faceted approach to provide a solution that would alleviate flooding, improve water quality, and be cost-effective for landowners within the drainage district.

The solution included consolidating the three subdivision storm water systems into the Beechtree Drain and connecting them with infrastructure to the drainage system to provide a better outlet for the storm water runoff. It also included open channel drain maintenance that occurred throughout the middle and northern portions of the drain and storm water storage was increased within the watershed by utilizing ponds on the newly renovated American Dunes Golf Club.

Water level control structures were installed to allow the OCWRC to control the amount of water stored within the watershed and the amount that is released directly to the drain. This infrastructure also allows the golf course to utilize the stored storm water for irrigation purposes.

"Facilitating infiltration is one of the best ways to manage storm water," Forton said. "Infiltration allows for the water to be treated as it moves through the soil, it reduces flooding, and recharges the local aquifer helping to create healthy wetlands and generate baseflow for local streams and rivers. With the amount of impervious infrastructure being constructed every day, simply conveying excess storm water is not always the solution."

Substantial completion of all the work for this improvement project was finished by the fall of 2021. Spicer Group was responsible for the inspection, design, survey, easement acquisition, bidding assistance, and construction administration and inspection on this project.

"Spicer Group put together a team that worked very well with our partners, residents and my team at the Ottawa County Water Resources Commission. As Commissioner, I am very satisfied with the final product of this project," Bush said. "The residents have been very happy as flooding and water table issues have decreased and detention and retention in the area has increased. Property owners have some comfort knowing we are here to help."

ASSOCIATE MEMBER NEWS

BRITTANY M. NICHOL NAMED A "TOP 5 UNDER 35" ATTORNEY BY THE INGHAM COUNTY BAR ASSOCIATION

Nichol

Attorney Brittany M. Nichol of Fahey Schultz Burzych Rhodes PLC has been selected as one of the "Top 5" attorneys under the age of 35 in Ingham County for 2022. She will be recognized at the Association's Thirteenth Annual Barristers Night on March 10, 2022. This prestigious award honors young attorneys who have distinguished themselves in their relatively short career by manifesting commendable character, integrity, judgment and legal scholarship; service to the profession and the bar; service to the community; and a reputation for the advancement of the highest legal standards and professional responsibility.

Brittany joined Fahey Schultz Burzych Rhodes PLC in 2019. She is a member of the firm's Drain and Municipal practice groups, representing clients in a wide range of complex legal matters.

HUBBELL, ROTH & CLARK, INC. BOARD OF DIRECTORS ANNOUNCE NEW BOARD MEMBER

Maxwell

Hubbell, Roth & Clark, Inc. (HRC) is pleased to announce the appointment of Thomas Maxwell to the Hubbell, Roth & Clark, Inc. Board of Directors effective January 1, 2022.

Thomas Maxwell, PE, Vice President, will strengthen and improve the capacity of the Board with his diverse background in the water and wastewater sector, specifically with his vast expertise in heavy construction of large multidiscipline projects. He has over 35 years of experience providing highly regarded infrastructure design and management for a wide variety of projects. He rejoined Hubbell, Roth & Clark, Inc. in 2016 after serving a short time for the Oakland County Water Resources Commissioner (OCWRC).

"Having worked for many years with his mentor, James (Jim) Hubbell, (HRC 1955-2000 and past president 1987-2000), Tom employs that legacy experience to current design and construction practices that is unique and highly valuable to our clients." ~Daniel Mitchell, President

We look forward to the contributions Tom will make toward the success of the company.

FLEIS & VANDENBRINK ADDS 11 NEW STAFF

Fleis & VandenBrink (F&V) recently added 11 new staff to its full-service engineering and architectural firm.

"We've had a lot of great hires," said Bob Wilcox, Principal and F&V's Vice President of Operations. "We've added not just horsepower, but a lot of great talent to our team.

"The additional staff allows us to continue to grow, develop and implement systems to improve our efficiency and pursue new opportunities."

Hart

Melonie Hart, P.E., joins the Development & Enhancement Group at the firm's headquarters in Grand Rapids as a project manager. Other new hires in Grand Rapids include Eric Daly, controller; Stacey Hough, construction technician; and administrative assistants Melissa Grasman and Kayla McClean.

Daly

Kevin Nehir, construction technician, and Timothy Bott and Levi Rowan, engineers-in-training (EITs), have joined the West Michigan Municipal Group at the Traverse City office.

Emma McDonald, EIT, and Karen Hicks, administrative assistant, joined the Kalamazoo office. Brad Danks, an engineering technician, joins the Grand Blanc office.

Hough

Hart brings more than a decade of experience in site development to F&V. She earned her bachelor's degree in civil engineering at Purdue University with a focus on land development.

McClean

The certified Envision Sustainability Professional (ENV SP) will manage site development projects that are sustainable and plan for the future, including commercial developments and parks and recreation projects.

Daly, who has a bachelor's degree in finance from Grand Valley State University, joins F&V with 20 years of experience as controller and chief financial officer.

He will assist the finance team with daily accounting tasks, managing the month-end close process and assist in the preparation and review of the company's financial reporting. His experiences will help support the ongoing strategic initiatives of F&V.

Hough and McClean join the Construction Services Group. Hough is a resident project representative (RPR) with years of previous experience in the agricultural industry. Her duties include project oversight, daily documentation, quantity tracking and materials testing. Hough's work ethic and previous managerial position will help her working with contractors and clients.

McClean recently received her bachelor's degree in Sustainable Built Elements from the University of Arizona. She also has an associate's degree in General Studies from Yavapai College, Prescott, Ariz.

McClean, who grew up in Michigan, has previous general office experience with

the Michigan Department of Transportation (MDOT). As a project assistant, she will help the Construction Services group with project delivery including construction administration on local and department of transportation funded projects.

Grasman

Grasman's previous office and legal experience and legal studies at Davenport University will benefit the Process Group. She will assist in meetings, proposals, service agreements, technical reports, correspondence, construction administration, project financial reporting, invoicing, and other accounting related tasks.

Nehir

Nehir has more than 16 years of experience in road and underground utility construction. The Northern Michigan University physical geography graduate will work on municipal construction projects as a RPR.

Bott

Bott graduated from Hope College with a bachelor's degree in civil engineering. He also interned at F&V and the Grand Traverse County Road Commission.

Bott will assist with the design of municipal projects, preparation of project plans and specifications, and construction administration. He will also be doing design calculations, hydraulic modeling, and develop asset management and capital improvements plans.

Rowan

Rowan, a 2021 Western Michigan University civil engineering graduate, joins F&V with MDOT and previous project engineering, including testing and commercial construction project supervision. He will be supporting the Traverse City office with a broad range of tasks including municipal road

McDonald

Hicks

Danks

and utility design, site superintendent and resident project representative for clients.

McDonald joins the West Michigan Municipal Group as an EIT. The Michigan State University graduate has a bachelor's degree in biosystems engineering. Her previous civil engineering experience on construction sites will help her working on projects in water, wastewater, and transportation, from concept to construction.

Hicks has a bachelor's degree in parks and rec administration from Illinois State University. The Naperville, Ill., native has 15 years of administrative assistant experience. Her experience will help Kalamazoo project managers with correspondence, report preparation and specification development including bidding and construction phase engineering services.

Danks joins the East Michigan Municipal Group and brings more than 25-years of civil engineering and GIS experience and expertise to F&V. He will assist with design and drafting and provide GIS consulting services to clients. Danks, who has an Associate's degree from ITT Technical Institute, started his engineering career as a CAD operator more than three decades ago.

FLEIS & VANDENBRINK NAMES 1 SENIOR ASSOCIATE, 4 NEW ASSOCIATES

Fleis & VandenBrink (F&V) announced today additions to its leadership/ownership team, adding a new Senior Associate and four Associates.

The changes were announced during the company's annual anniversary breakfast meeting for its employees in Michigan and Indiana. F&V,

which was founded in 1993 by Larry Fleis and the late Steve Vanden Brink, celebrated its 29th anniversary on Jan. 12.

Harvey

David Harvey, P.E., was named new Senior Associate. New Associates include Ken Mlcek, P.E., Trevor Woollatt, Darold Harlan and Brad Nanzer.

"I'm very excited for our new Associates and Senior Associate and I am also excited for our company," said John DeVol, president of F&V and its parent company F&V Companies, Inc. after announcing the new leaders. "One of the most important parts of being invited to be part of our Principal/Associate program is living our company values every day. They have worked very hard, and this shows that their peers recognize their contributions.

"Another important thing to celebrate today is that this announcement is a reminder that the transition plan started over 16 years ago is providing tremendous opportunities for our people."

F&V has grown from a two-person civil engineering firm to one with nine offices in Michigan and Indiana. The Principal/Associate program was started in 2006 to promote leadership and ownership transition. Principals and Associates are nominated by their peers and vetted out by the Principals and Senior Associates.

Harvey, a senior project manager, joined F&V's Process Group in Grand Rapids in 2002. He specializes in environmental engineering projects including wastewater treatment, wastewater collection, water distribution systems, and solid waste systems.

Harvey has been involved in preliminary design evaluations and reports, feasibility studies, and project plans, as well as major design and construction projects. Harvey has a bachelor's and masters degree in civil engineering from Michigan Technological University.

Micek, a project manager, joined F&V's Municipal Group in 2005. The northern Michigan native specializes in municipal utility project designs and works out of the Traverse City office. Micek has a bachelor's degree in civil engineering from Michigan State University.

Micek

Woollatt

Woollatt joined F&V's Environmental Group in Grand Rapids in 2018 as a senior project manager. He has more than two decades of experience in structuring local, state and federal incentives for redevelopment and economic development and decades of practical environmental due diligence experience. The Maryland native has a bachelor's degree in geology from West Virginia University.

Harlan

Harlan is an operations specialist in southwest Michigan. He joined F&V Operations & Resources Management, Inc., in 2016. The Indiana native has an associate's degree in applied science and electrical engineering.

Nanzer

Nanzer joined F&V's Survey Group in 1995. The survey crew chief specializes in survey and infrastructure projects. The Michigan native is a Ferris State University grad.

"I am very proud of all F&V staff and the new leaders," said Larry Fleis, chairman of the board of directors for F&V Companies, Inc. "Happy Anniversary!

"It all started 29 years ago today, so this day brings back a lot of good memories when Steve and I were in our cars on our bag phones. It's really incredible where this company is going, the visioning and all the successful transitioning that is going on."

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MACDC EVENT CALENDAR

MAY 5, 2022
Northwest District Meeting
American Dunes Golf Club, Grand Haven

MAY 6, 2022
Southwest District Meeting
Weko Beach House, Bridgman

MAY 26, 2022
Northeast District Meeting
Dow Event Center, Saginaw

JULY 13-15, 2022
MACDC Annual Summer Conference
Crystal Mountain Resort, Thompsonville

Editor's Note: to place your event on this calendar, contact us at admin@macdc.us or 517.484.9761.

IN MEMORIAM, LOWELL "SPIKE" BRUCE

Lowell "Spike" Bruce (left) with Berrien County Drain Commissioner, Christopher Quattrin

It is with great sadness we share the passing of a past MACDC President and Life Member, Lowell Guy "Spike" Bruce.

Spike was born Jan. 3, 1937, to Fred "Bud" and Lucille (Burroughs) Bruce in Buchanan.

Spike was active in Berrien County, making friends wherever he went. He served on the Berrien County Youth Fair Board of Directors, was the Berrien Township Supervisor for 14 years, Berrien County Drain Commissioner for 16 years (1986 - 2002) and was selected President of MACDC, all while farming and raising a family.

In 1959, Spike married the love of his life, Henrietta Heritz, and together they raised three wonderful and now very successful children: Barbara (Del) Rockwell, Robert "Bob" (Beth) Bruce, and Brian (Mary) Bruce. Together they blessed Spike with seven grandchildren: Del and Cody Rockwell (sons of Barbara and Del), Emilie, Kelly and Collin (daughters and son of Bob and Beth), and Anna Kieran and Tyler Buck (daughter and son of Brian and Mary); plus, a great-granddaughter, Lucille Garrett (daughter of Kelly Bruce and Wayne Garrett).

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