Straight Lines

Winter 2018

Spicer group

WINTER 2018

FRONT COVER: MAPLE RIVER- EMMET COUNTY
INSIDE COVER: MANISTEE HARBOR

THE EYES AND EARS OF OUR CLIENTS

The concrete deck of the Zilwaukee bridge sits on more than 100 bearings, built to allow controlled movement of the 8,000-foot-long overpass that spans the Saginaw River. And while more than 21 million vehicles travel that bridge annually, a view of the inner workings of the bearings isn't something most people will ever have the chance to see.

During a recent summer construction season, Nathan Pfenninger, P.E., a Construction Services Technician for Spicer Group, spent most of his working time more than 120 feet off the ground on a steel platform built around the Zilwaukee Bridge's piers specifically to give just that view.

Pfenninger was part of a team of construction inspectors from Spicer Group that assisted the Michigan Department of Transportation to oversee work on the $70 million project to replace the bearings on the bridge. The 2-year-long project also included rehabilitation and maintenance work on the structure that carries traffic along I-75.

"This was a once-in-a-lifetime thing. This is probably the only time a project like this will ever happen until that bridge is scheduled for full replacement," Pfenninger said. "I've crossed the Zilwaukee Bridge since I was a little kid and being able to work on it and be underneath it on the platforms, I loved every bit of it."

Our group of trained and experienced construction services professionals have been providing inspection, testing, and administration services to clients for projects since the beginning of our company in 1944.

As a construction service technician, employees receive hundreds of hours of classroom and hands-on training for the proper ways to test, inspect, and record everything from the integrity of paint on a steel bridge, to the density of the materials beneath a roadway, to the depth a water main is laid beneath the ground.

"We are the eyes and ears on the project for the engineer, designer, project manager, and client," Jon Townsend, a Senior Construction Services Technician at Spicer Group, said. "Essentially, you interpret plans and specifications of a project to make sure it is being constructed safely and properly. It gives our clients added security and insurance knowing that at the end of the project, it is a good product that is going to last."

On the job-site, this position requires communication between all involved entities: from engineer to client to contractor and landowner. That communication is key when challenges or last-minute changes arise throughout the project construction phase.

"Challenges could come from anywhere and everywhere on the job," Townsend said. "The design could be flawless, but if things like a supplier can't meet the demand, or there's an unknown historical flooding issue, changes have to be made."

Those challenges also make the job unique. Every day on a project is an opportunity for something new for Spicer's construction service technicians – sometimes having nothing to do with the project itself.

While inspecting the removal and replacement of roadway and sidewalks along Grand River Avenue in East Lansing, Senior Construction Technician Brian Van Norman, could only watch as a driver went around barricades and drove a blue Volkswagon Bug into the freshly-poured concrete of an entrance ramp.

"Sometimes all you can do is laugh and call a tow truck," he said.

Watching a project grow from plans and design, to construction and completion, can also be a rewarding experience.

Kurt Engelhardt, a Senior Construction Service Technician at Spicer Group with more than 17 years of experience, spent countless hours as the technician on a project to build five miles of brand new road for MDOT for the US-131 bypass around the small town of Constantine.

"Where there was nothing there before, now there is something," he said. "There's a road that I can drive my family down for years to come and tell them I helped build it."

These professional services we offer our clients ensures their projects are being constructed stronger, safer, and smarter. And whether it is on the side of a bypass road, or high in the sky on a bridge rehabilitation, it will always offer our construction services technicians a unique point of view.

BELDEN TILE DRAIN

Using Chapter 20 of Michigan's Drain Code helps finance project.

WAYNE COUNTY—Thanks to an innovative funding approach, residents within the Belden Tile Drain Drainage District were able to fast-track needed drainage improvements and now have a much lower risk of experiencing similar devastating effects caused by a freak storm event in June 2015.

The Belden Tile Drain is less than a mile long with the last petitioned project in 1925. Established in the 1870s, the drain services a 66-acre watershed comprised of a mix of rural lands and residential neighborhoods. The upper section of the watercourse runs through a wooded area and flows south under Willow Road and eventually empties into the North Branch of Big Swan Creek Intercounty Drain. Prior to recently-completed improvements, the drain consisted primarily of a 12-inch clay tile that was later found to be in very poor condition and nearly 100-percent plugged in areas.

Unknown to Township and County officials at the time, the true magnitude of the poor condition of the drain wasn't recognized until after a major rain event hit the watershed in June of 2015.

Several residential properties were inundated with flood water after the June 2015 storm including one resident who had water flowing up from the drain and out of his crawlspace. The lands north of Willow Road were not draining at all after the event, and residential areas south of Willow Road also experienced long periods of standing water and damaging sinkholes in their yards and near their homes. Elmeka Steele, Esq., Interim Wayne County Drain Commissioner, evaluated the damage and decided that temporary emergency actions had to be taken while a solution was identified, which included the installation of pumps at various points along the drain to alleviate standing water that was not reaching an outlet.

"Taking prompt action to address the potential threat to public health was the top priority of our team," said Steele when reflecting on the emergency conditions.

Steele consulted with Spicer Group to quickly identify the cause of flooding and develop an action plan to mitigate property damage as best as possible. Spicer Group tried using video inspection equipment to get a better idea of the condition of the tile drain but was not able to run cameras very far due to obstructions in the tile. They ran into this issue consistently wherever they investigated the tile, and came to the obvious conclusion that the majority of the Belden Tile Drain was beyond repair due to root intrusion, severe cracking, separation, infiltration, and severe blockage. Also, during their field investigation, the team realized that several sections of the Belden Tile Drain ran directly beneath houses, yards, sheds, pools and driveways, making access to these sections virtually impossible.

Spicer Group Project Manager Christopher Mattson, P.E., explained that based on limited video inspection results, field analysis, and meetings with contractors, his team recommended a couple solutions.

"We advised that the original clay tile should be abandoned in place and that the section of drain south of Willow Road be relocated, and the section of drain north of Willow Road be replaced," Mattson said. "But we had to figure out how to fix the problem as quickly as possible, yet make it practical so the cost could be affordable to those being assessed." Steele suggested Huron Township submit a petition under Chapter 20 of the Drain Code rather than under the typical Chapter 8 process. Chapter 20 provided Huron Township a way to finance the project and allowed for an expedited petition process of only 8 months from the date of petition to the bid opening.

New open-drain portion of the project.

"Our constituents wanted results, fast. I listened and by thinking 'outside the box' and utilizing a Chapter 20 petition process for the project, it was a win-win for the Township and the landowners in the Drainage District," said Steele.

The project team also had to coordinate extensively with landowners to understand how their properties were tied into the original drainage system including documenting yard catch basins, sump lines and areas of standing water. This was very important because when the Belden Tile was eventually relocated, the project team wanted assurances that every landowner was accommodated accordingly and that all drainage patterns were accounted for as well.

"We went out and met with every landowner on an individual basis and sketched a layout of their private drainage features," Mattson said. "This proved to be a very successful effort when the project was designed and constructed."

During construction, several obstacles were overcome while working alongside the existing

utilities. Mainline utilities and utility services were relocated regularly during the course of construction to accommodate the relocated drain. The crossing design at Willow Rd. included boring the road to maintain traffic and minimize delays for commuters. During the installation of the bore casing, an abandoned concrete pipe was encountered under the road. The contractor attempted to bore through the concrete pipe, and the road began to slough into the bore pit due to the significant vibrations from the bore operations.

Work was stopped immediately and an open-cut operation was coordinated with the Wayne County Department of Public Services, Engineering Division and Roads Division. A road closure was performed with a detour in coordination with the County, school district, post office, emergency services, and trash collection services. The road closure and associated crossing work was completed and the road was re-opened in five days.

A new concrete storm sewer was installed along Denning Street and along the north edge of a neighboring sod farm to connect to an existing portion of the tile downstream that was replaced in the 1980's.

Improved open-channel portion of the drain.

Mattson said that relocating the drain did require the acquisition of many new easements, but that time and effort was offset by the expense that would have been incurred by replacing the drain in its original location.

"A significant amount of expense was eliminated by not having to replace the drain which would have required digging up back yards, pools, driveways, and even underneath home foundations. This initial alternative would have also taken much more time to complete construction," Mattson said.

Using Chapter 20 of the Michigan Drain Code not only made the project affordable for residents, but also feasible. Using Chapter 20 is a great example of how county drain commissioners can work with local governments in making projects affordable. Thanks to innovative thinking on the Wayne County Drain Commissioner's behalf, impacted property owners were able to afford and receive much-needed drainage improvements to their area without sacrificing the quality of the design.

FULTON STREET DRAIN

RECONSTRUCTION OF TREND STREET FOLLOWING STORM SEWER INSTALLATION

VILLAGE OF MAYVILLE—Residents are resting easier during major storm water events now that the newly-established Fulton Street Drain is providing an adequate route for runoff to exit the Village.

Historic Mayville is located along M-24 about 80 miles north of Detroit in Michigan's Thumb region. Settled in 1865, the Village grew as a result of the railroad extending tracks to the area in 1882.

The Village's original drainage system had not received updates for an estimated 100 years and was causing flooding along busy Fulton Street which provides direct access from M-24 to Mayville's downtown area. Residents were suffering from flooded yards and basements, and the constant freeze-thaw cycle occurring over flooded sections of the roads was deteriorating them severely to a point where they were becoming hazardous to vehicles.

Tuscola County Drain Commissioner (TCDC), Robert Mantey, was contacted by the Village to help identify a solution to the flooding problems. Mantey worked with Spicer Group to conduct an engineering review to identify the main causes of the drainage problems, including solutions to alleviate the problems.

"We reviewed existing aerial, contour and sewer district maps and met with Mayville staff to identify and prioritize other drainage problems occurring within the Village," Spicer Group Project Manager Nick Czerwinski, P.E., said. "During that review, it was evident that the Village's natural topography on the north side of town tends to slope northerly toward railroad tracks that skirt the other limits of town. During storm water runoff events, water flows and collects along the busy Fulton Street especially in a low area where the road crosses the railroad tracks."

According to Czwerinski, broken and collapsed sections of the old clay-tile drainage system combined with the natural topography of the area and an undersized outlet into a wetland area was the main cause of the flooding problems.

Spicer Group and the TCDC recommended establishing a new drain route through the Village, which included 2,280 feet of open-channel drain and 1,730 feet of enclosed drain

FIELD INSPECTION OF THE ORIGINAL DRAINAGE ROUTE PRIOR TO CONSTRUCTION.

OPEN-CHANNEL DRAIN DOWNSTREAM OF WEATLAND AREA.

ranging in depths from 4 feet to 8 feet. A new 36-inch storm sewer was also proposed to replace the original 18-inch sewer at the outlet of the enclosed drain.

This information was presented at a Board of Determination Meeting, and the project was deemed necessary. The project team moved forward with efforts which included clearing of trees and obstructions located on the open drain route, installing new storm sewer and drainage structures, and reconnecting existing service leads from old drains where removed.

“During the design phase, we used existing LiDAR to select preliminary routes for the new drainage infrastructure,” Czerwinski said. “In the past, for projects like this it was a very time-consuming process to collect data on elevations and topography which was then brought back to the office, processed and then studied to help identify the best possible drainage routes.”

Czerwinski said that LiDAR provides engineers a highly-detailed and accurate view of current elevations and drainage patterns to preliminarily select routes that fit and don’t fit the project’s needs, which helps expedite the analysis process and positively establish a drainage route.

“Once we identified the best route for the new drain, we only had to send surveyors out once to gather the required data needed for the design,” Czerwinski said.

A unique design component that was incorporated into the improvements was the use of an existing wetland area to both store and filter floodwater. The wetland area was located downstream from the intersection that was constantly plagued by flooding. The project team directed all storm water flows to this area and added a new 36-inch outlet at the upper end of the wetland area.

The 1.6-acre wetland uses natural processes to clean storm water before entering into an open-ditch area and eventually flowing away from town. The wetland area serves as an excellent detention area, allowing discharge in heavy storm events to collect without causing flooding upstream or downstream. The project team also took extra steps to stabilize all bank areas where open-ditch construction was used, which will significantly prevent future erosion and reduce sediment loading.

Robert Mantey explained that during the design phase, the project team used as much existing open ditch and stream as possible to minimize the use of enclosed sewer. Doing so saved a significant amount of money in material and labor costs and also minimized disruption to current land use.

Constructing a project like this through the middle of an existing town of this age leads to the requirement for extensive coordination and research.

In order to construct this project the following efforts needed to be completed which were large tasks in themselves: obtaining easements from private land owners for the entire project route, obtaining permits from two separate railroad companies, performing extensive research on existing underground facilities, and obtaining MDEQ permits for the construction of the drain due to this project establishing a new county drain.

Additionally, the project was coordinated with a roadway improvement project that was being constructed within the district during the design phase of the drain. The project team coordinated efforts so that construction crews working on the roadway improvement project installed drainage structures that would later be used when completing the drainage improvement project, thus saving money in not having to duplicate restoration efforts.

“Combined, all of these efforts saved the drainage district several hundred thousand dollars,” Mantey said.

The total project cost of the Fulton Street Drain project was approximately $821,000.

MONITOR TOWNSHIP PAVING

MONITOR TOWNSHIP - After years of no significant improvements to a majority of the streets traveled every day by residents, a project to resurface local roads in Monitor Charter Township is almost complete.

In an unprecedented move in 2014, Monitor Charter Township was one of three Bay County municipalities to include a new millage on the August voter ballot to acquire the funding necessary to make local road improvements. The millage called for 1.95 mills to be collected by the Township for road improvements over a 10-year period and was passed by more than 100 votes.

“Most of the local roads in our Township were in poor condition. Some were average, but over all, they were in vast need of improvements,” Monitor Township Supervisor Ken Malkin said. “It is hard to prioritize all the needs that a Township may have, but this was clearly at or near the top, based on the conditions of our roads and the township having no ability to improve the situation or the financial resources to do it.”

The millage allowed the Township to collect more than $500,000 a year over a 10-year period to make the necessary improvements to roads within Township limits that were not being maintained by the Michigan Department of Transportation or the Bay County Road Commission.

Spicer Group assisted the Township with conducting a study of more than 53 miles of road to determine what improvements needed to be made. Resurfacing and improving every road in the Township would exceed the amount of the millage, so Spicer’s engineers worked with Township officials to prioritize the projects.

Malkin said the Township was able to borrow money against the millage in order to improve the roads at a rapid pace, saving money on fuel and construction while those prices are still generally low.

“The Township wanted to make an impact,” Don Scherzer, Spicer Group’s Executive Vice President said. “Some of these roads had not been touched for 30 years or more because of a lack of funding from the state. They’d only been patched here and there.”

In 2015, improvements to 18.5 miles of local roads were made. In 2016, 5.75 miles of local roads were improved and in 2017, 8.25 miles of local road projects were completed. This year the planned construction will be around 4.5 miles of roads being improved.

“Those projects typically included crushing the existing surface of the road, regrading and compacting it, then paving the road with three inches of asphalt,” Mark Norton, the project engineer for Spicer Group said.

Multiple Special Assessment Districts (SAD’s) have been created in seven subdivisions throughout the Township to add curb and gutter and storm sewer improvements to those areas. Construction within five of these districts will take place in conjunction with this year’s planned road improvements. The two other SAD’s were completed with the 2016 projects.

Spicer Group was responsible for the design, bidding and construction administration on each of the projects, some of which occurred simultaneously throughout the years.

There are nearly five miles of roadway that is still being considered for improvements within the millage funding and time frame. The improved roads have made an impactful difference in travel for Township residents.

“Overall our residents have been very happy with the road improvements,” Malkin said. “The biggest issue was not the quality of the work – but residents being impatient with getting their neighborhood done sooner.”

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SPICER NEW HIRES

Adam Lenk: Adam was hired into the Municipal Group in our Saginaw Office as a Project Engineer. He earned his bachelor's degree in Mechanical Engineering from Central Michigan University.

Richard D. Kathrens, P.E.: Rich was hired into the Municipal Group as a Project Manager in our St. Johns office. He previously worked at MDOT for 13 years as the Bridge Safety Inspection Program Manager. Serving as the Department's statewide bridge safety inspection engineer, Rich was responsible for oversight and guidance of the state's highway bridge safety inspection program and was responsible to ensure compliance with the National Bridge Inspection Standards (NBIS). He also served as the Movable Bridge/Fracture Critical inspection engineer responsible for inspection and assisting with the asset management with these complex structures. He has nine years of previous experience at Spicer Group and is a licensed Professional Engineer. Rich is a graduate from Michigan Technological University.

Gabe Raymer: Gabe was hired into the Construction Services Group in our Saginaw office as a Construction Services Technician. He earned his bachelor's degree in Construction Management from Ferris State University.

Dustin Holbin: Dustin was hired into our Survey Group in the Saginaw office as a Survey Technician. He comes to Spicer with survey experience in North Carolina and Flint.

Brandon Williams: Previously an intern at Spicer, Brandon was hired on full-time as a designer in our Water Resources Group in the St. Johns office. He earned his bachelor's degree in Civil Engineering from Michigan State University.