



STRAIGHT

LINES

SPRING 2017

Spicer
group

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Front cover: Great Lakes Bay Trail in Frankenlust Township.
Inside cover: One of Spicer's inspection trucks on-site, North I-75, just south of the Zilwaukee Bridge, taken by Nathynn Mitchell, E.I.T.

New Leadership Roles Assigned at Spicer

Cliff Spicer opened the doors of Spicer Engineering for business in 1944 in Saginaw, MI. Now, 73 years later, Cliff's original one-man operation is known as Spicer Group and includes 175 staff and offices in Saginaw, St. Johns, Lansing, Manistee, Dundee, Grand Rapids, MI, and an office in Atlanta, GA. Our operations have expanded to include fully-staffed surveying, water resources engineering, structural engineering, electrical engineering, municipal engineering, site engineering, construction engineering, transportation engineering, community planning, and architectural departments.

Throughout Spicer Group's history, our various leaders have continuously succeeded in guiding the company in a positive direction—always holding on to Cliff's main principles of encouraging strong work ethics, producing high-quality work, and maintaining satisfied clients. Spicer Group is a strong and growing company and to ensure we continue exceeding all of our clients' needs in a competitive market place, new roles have been assigned to top management at Spicer Group in conjunction with the naming of a new president. This strategic effort is aimed at strengthening our current client relationships, building new partnerships and managing an even balance among the complexities, demands, and benefits associated with expected growth well into the future.

Robert Eggers, AICP, recently took the helm as Spicer Group's President. He started employment at Spicer in 1996, was named an Associate in 2000, a Senior Associate in 2002, and became a Principal in 2004. He has served on Spicer's Board of Directors for seven years. Eggers will continue to manage Spicer Group's Community Planning Services Department. Eggers was instrumental in developing Community Planning services as a core strength at Spicer through innovative recreation design, grant writing and community planning leadership initiatives, and Spicer continues to emerge as a statewide leader in those areas. He received his Bachelor of Science in Community Development, Cum Laude, from Central Michigan University in 1996 and an Associate in Applied Science in Architectural Technology from Delta College in 1984.



Transition in Leadership



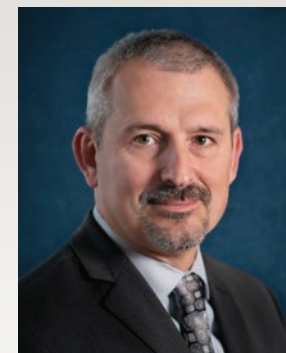
Donald Scherzer has transitioned into the role as Spicer's Executive Vice President after leading the company as President for 11 years. Scherzer began at Spicer in 1979 as a designer and progressively fulfilled many project management-related roles before being named Vice President in 2000 and President in 2006. He sits on Spicer Group's Board of Directors, has been a longtime leader of Spicer's Municipal Services Department, and will continue to assist that department's growth and sustaining key client relationships. Scherzer earned his Bachelor of Science in Industrial Education from Central Michigan University in 1977.



Larry Protasiewicz, P.E., was appointed as Spicer Group's Chief Financial Officer after serving as Vice President for 11 years. He is a member of Spicer Group's Board of Directors and is credited for continuing Spicer's legacy as a leading water resources firm. His 28 years of forging new relationships and incorporating leading-edge technology into projects has contributed significantly to the firm's brand and growth. Protasiewicz became an Associate of Spicer Group in 1991 and a Senior Associate in 1994. He was named a Principal of the firm in 1996. He received his Bachelor of Science in Agricultural Engineering and Master of Science in Agricultural Engineering from Michigan State University in 1986 and 1990 respectively.



Jeffrey Wood, P.S., was recently appointed as Spicer Group's Chief Operating Officer. He serves on Spicer's Board of Directors and also oversees the Survey and Developmental Services Departments. He began at Spicer in 1993 and was named an Associate in 1998, a Senior Associate in 2000, and a Principal in 2002. In addition to growing Spicer's survey department, Wood played a key role in incorporating high-tech survey technology including Mobile Mapping and Laser Scanning into Spicer's business strategies. These efforts have helped push Spicer's survey capacity to be a nationwide survey service provider. He received his Bachelor of Science in Surveying from Ferris State University in 1991.



Ronald Hansen, P.E., P.S., was recently named Spicer Group's Vice President. He has been with Spicer since 1993 and serves on Spicer's Board of Directors and oversees a significant amount of Spicer's water resources-related work. Hansen's 24 years of successful accomplishments are credited as being a key contributor to Spicer's growth in the water resources arena and staff development. He was named an Associate in 1998, Senior Associate in 2000, and Principal in 2002. He received his Bachelor of Science in Civil Engineering from Michigan Technological University in 1993 and his Bachelor of Science in Surveying from Michigan Technological University in 2005.

Forensic Engineering: What Caused the Fall?

Chesaning - In the nave of a church that was built in the late 1860's, two rows of tables are neatly arranged with lamps, stacked with quilting fabrics, and lined with high-back chairs, just waiting for crafters to get to work.

The tables are stations set up for Creative Passions Crop and Quilting, an adult women's retreat that now calls the historic church home. The tables are not only a far cry from the pews that originally lined the room, but also from the disaster that occurred in the structure a year ago when the roof section under the building's bell tower collapsed.

"It was a mess," John York, P.E. a structural engineer and the project manager with Spicer Group said. "Half of the front of the building, all of the drop ceiling, all of the lights, the old insulation, all of it, came crashing down onto the floor."

On a windy afternoon in early April of 2016, ceiling panels began falling, prompting those in the building to move to a safer area. Moments later, large wooden rafters crashed to the floor and the building was evacuated.

Less than 48 hours later, Spicer Group's structural experts were called in to complete an analysis on the structure using forensic engineering to determine the cause of the collapse.

Originally built in 1868, the church located at 203 South Front Street in Chesaning added on a bell tower in the 1880's.

York said when the bell tower was added on, no additional support beams were constructed to hold the weight of the tower.

The building had otherwise been maintained well for the span of its life, and in 2012, after the Creative Passions business purchased the property, it underwent a complete renovation, York said.

That bell tower extended 12 feet above the center peak of the church building and provided a great amount of leverage that induced high stress on certain beams within the roof structure. On the day of the collapse in April, the wind was blowing in a northwest direction in the area, and wind loads generated from that are what caused the structure to fail.

"While there is little doubt that the age of the structure impacted the structure's ability to withstand this load," York said. "Wind loading ultimately caused the structural failure."

Inside the structure, one of three main supporting rafter beams failed on the east side of the building when the wind load got too heavy.

When that main rafter beam dislodged from the top of the wall, it came to rest on a northwest stain-glassed window in the building. It also caused the remaining support structure to become overstressed and the entire west half of the chapel section collapsed.

The building structure redistributed the loads, causing the building walls to bow and the bell tower to start sagging.

After the collapse, the building was deemed unsafe for occupancy while Spicer Group designed a building stabilization plan so construction crews could not only begin cleanup, but also remove the bell tower and build in a tension cable assembly to ensure structure stabilization for the future.

Once the tension cables were installed, the rest of the structure could be repaired. The bell and portions of the tower now sit on the front lawn of the building for others to see a glimpse of the area's history.



The 130-year-old bell tower that was removed from the Creative Passions building now sits on display on the front lawn.

The 150-year-old Creative Passions building prior to the removal of its bell tower.





Great Lakes Bay Regional Trail
MAKING STRIDES

Six miles of non-motorized trail, two retro-fitted bridges, and more than \$3 million in grant funding later, the first milestone to connect Saginaw and Bay Counties via non-motorized pathway has been met.

Construction was completed in 2016 on 6.2 miles off the Great Lakes Bay Regional Trail (GLBRT) along the Saginaw River in Frankenlust Township that now connects Saginaw and Bay Counties in a way they never have been before.

The GLBRT is a planned, paved, non-motorized pathway that will connect nearly

60 miles of trails in Saginaw, Midland and Bay Counties. In 2008, Spicer Group assisted the GLBRT Committee with developing an implementation plan for the trail. From that plan, it was determined the Saginaw to Bay County link was the highest priority.

"We worked to develop an overall plan and vision to create connectivity between the three counties," Heidi Bolger, the former president of the GLBRT Committee, said.

"This connection was made the first priority. If you look at the distance between Saginaw and Bay County, with the trails that we already had on the ground, it was doable to connect those two population centers."

Paths existed in Bay County, Kochville, and Zilwaukee. This portion of trail was planned to connect those trails and make it possible for runners, walkers, bikers, and others to travel through a system that is designed exclusively for non-motorized transportation.

In 2012, the Michigan Department of Transportation acquired the six-mile abandoned rail corridor for this section. The north end of the path begins in Bay County at the Consumers Energy Trailhead parking lot located at Hotchkiss Road. The path then runs south along the Saginaw River, where it crosses through the Crow Island State Game Area and down to Melbourne/Kochville Road in Saginaw County.

For the first phase, Spicer Group assisted Frankenlust Township, who partnered with the GLBRT Committee, in preparing and submitting a Michigan Department of Natural Resources (DNR) Trust Fund grant for \$300,000 to renovate two existing timber railroad bridges along the route and pave the section of path between them.

Spicer's structural engineers completed a structural analysis of both the 207-foot-long and the 322-foot-long wooden-trestle bridges, which had not been in use for many years. While most of the existing piers, abutments and existing substructures had survived the years, weather, and even a fire, the decking had to be removed and some

segments of the substructure on the bridges had to be replaced.

The second phase of the project was to complete the portion of the pathway in Saginaw County which runs from Melbourne/Kochville Road, north to the Saginaw and Bay County line. This was made possible with the help of a \$280,000 grant from the DNR Trust Fund that Spicer Group assisted Saginaw County in writing.

While this section of the trail had the rails removed, the majority of the rail bed had become densely overgrown. Spicer's surveyors needed chainsaws to access most of the areas.

Construction was completed in 2015 on the improved 10-foot-wide path that is now paved with asphalt. Spicer provided all design for this project, which included some cross culvert replacement, site clearing and soil and sedimentation control measures to protect any low or wet areas in the state game area.

The project included interpretive signs to educate users about the Crow Island State Game Area and the Dredged Material Disposal Facility site.

In 2014, Frankenlust Township was awarded another DNR Trust Fund grant for the third phase of connecting this pathway running

from the Saginaw and Bay County line north thru the Crow Island State Game area to the portion of the path that was already constructed with the bridges.

This part of the project includes a small section to connect the bridges north to Hotchkiss Road, where a trailhead with parking, benches, and informational signs were constructed. Construction was completed on the trail in 2016.

"The path turned out great," Frankenlust Township Supervisor Ron Campbell said. "The people that have used it, love it. It's a great trail."

Bolger said none of this would have been possible without the collaboration the GLBRT Committee has had between the people involved in all the municipalities and those who have assisted on the projects.

"It has been a great working relationship," she said. "I'm more pleased than I can communicate in terms of the progress we made and what is ahead for trails in our area. We have all hands on deck and people are excited about having their own trail system."



Before

Top: Portions of the trail before improvements were made.
Bottom: Old, burnt railroad bridge in Frankenlust Township before refurbishment for trail use.

After

Top: Completed trail hosts 5k for ribbon cutting.
Bottom: The finishing touches are put on the pedestrian bridge after rehabilitation.



City of Manistee - In 1911, it took a small crew of five men months of digging by hand through solid clay and rock to build a four-and-a-half-foot square concrete tunnel beneath the Manistee River that housed all the utilities connecting the north and south sides of town.

In 2016, it took a crew from Gabe's Construction, of Sheboygan, Wisconsin, less than two weeks to directionally drill a 900-foot-long hole, 120-feet down through that same solid clay and rock below the riverbed for installation of a new 10-inch fusible PVC force main pipe to carry sanitary wastewater across the river.

And while the hand-dug tunnel has lasted more than 100 years, the City and its surrounding areas have expanded since it was installed, rendering some of the utilities, like the original 8-inch cast iron sewage force main pipe in the concrete tunnel, undersized, worn out and in danger of failure.

Manistee had been looking at ways for the past decade to replace or rehabilitate not just the force main in the utility tunnel, but to also complete nearly \$2 million in upgrades to their wastewater collection system, specifically the portion that transfers sewage from

the north side of the City to its treatment plant on the south side of the Manistee River.

"The original design of the pump station did not contain a wet well, therefore the main was continuously surcharged," Jeff Mikula, the Public Works Director for the City of Manistee, said. "The interceptor sewer ran along the bank of the Manistee River and was pile-supported for 300 feet over the water. The support piles had begun to fail and the pump station was under capacity and well beyond its design life."

Spicer Group's engineers designed a solution that included installing a new pump station, abandoning an existing force main located in the original tunnel beneath the river, directionally drilling a new force main beneath the river and installing new gravity sewer pipe which replaced a section of 12-inch cast iron exposed sewer pipe along the river, and installing a new sheet-pile seawall to bury and shield that new 15-inch PVC pipe.

"This was a very complicated project," Brian House, P.E., the project manager for Spicer Group, said. "This was vital infrastructure to the City, and flows had to be

"THIS WAS A VERY COMPLICATED PROJECT," BRIAN HOUSE, P.E., PROJECT MANAGER FOR SPICER GROUP, SAID. "THIS WAS VITAL INFRASTRUCTURE TO THE CITY."



MANISTEE

6TH AVENUE
PUMP STATION & RIVERBANK
SEWER IMPROVEMENTS

New seawall and bypass pumping during construction.



Above: Drilling beneath the Manistee River.



Above: New force main pipe waiting to be pulled under the Manistee River.

Below: Installing the new sheet pile wall from a barge.



constantly maintained, as well as working around the Manistee River, which is a Federal Navigational Waterway. Coordination efforts from Underground Solutions, Gabe's Construction, Davis Construction, Swidorski Brothers Excavating, Topline Electric, and the City of Manistee were critical to project success."

Because of freighter and barge traffic down the river, crews not only had to carefully time drilling the hole for the new force main, but also for the installation of the new sheet pile wall.

Flow monitoring and LiDAR survey information obtained by the City's wastewater asset management grant project was used to determine the size and capacity of pumps needed to handle the wastewater safely and where the new interceptor sewer and the new sheet-pile seawall to house and protect it would be placed.

Construction began on the project in early 2016 and the new sewer line was put into service in late November of last year.

"The staging and scheduling around all the conflicts was carried out very well by Spicer and Davis Construction," Mikula said. "The new interceptor sewer, pump station and force main will improve reliability and efficiencies to serve the City's northern customers for the next 50-plus years. The system is operating as planned and the City is very pleased with the results."



Above: Pouring concrete from a barge.

Below: New pump station.

Below: Finished pump station project.



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Above: 3D spatially-accurate model reconstructed from aerial photos taken from our UAV.

Spicer Group is now offering unmanned aerial vehicle (UAV) technology to perform photogrammetric and remote sensing services. Continuing to lead the industry with advanced technical services, we are able to collect high-resolution aerial imagery which can be used to create ortho aerial imagery, 3D mesh models, digital surface models (DEMs), 3D point clouds, and other detailed mapping deliverables. UAV technology is another tool in our expansive toolbox that allows us to help our clients obtain 3D mapping products that meet their specific project requirements in the most efficient way. In addition to using UAV technology for traditional mapping applications, we can now acquire stockpile volumes more accurately and efficiently than possible with ground surveying. Our team is able to quickly fly a project site, process the imagery, and deliver a 3D-textured model to the client in their web browser, making the technology ideal for continuous monitoring of ongoing construction projects. Look for the next issue of Straight Lines for a more in-depth article on our UAV technology.

For more information about our UAV offering and how the technology may benefit you, please call Jeremy Dancer, P.S. at 989-763-2837.