

Afinitas, Clayton, MO 63105 USA

On the Front Lines of Pipe Plant Automation

With a difficult labor market, Bill Washabaugh Jr., who leads USA company Northern Concrete Pipe, understands that automation is key to making their family business, employees, and the concrete pipe industry thrive. For that reason, when it came time to upgrade his Grand Rapids, Michigan, plant, he reached out to Afinitas company HawkeyePedershaab to assist with setting his plans for technology innovation and increased automation in motion.

Interstate 96 connects the major cities of Michigan, from Grand Rapids in the west, through Lansing in the central part of the state, to Detroit in the east. It's a lifeline of sorts through the state, so it makes perfect sense that Northern Concrete Pipe would locate three of its five plants in close proximity to I-96. With those three sites, plus the original Bay City location 100 miles north, and a plant just over the border in Sylvania, Ohio, Northern has a solid reach throughout the region as it powers into its seventh decade of manufacturing pipe and other critical infrastructure products such as manholes, box culverts and three-sided bridges. Founded in 1958 by the Washabaugh family, the company is now in its third generation of family ownership, with Bill Washabaugh, Jr., at the helm.

Those deep Michigan roots may help explain why Bill Washabaugh takes seriously his ongoing commitment to the family business, the concrete pipe industry, and Northern's employees. And it is also behind the company's multi-year plan to upgrade each of its plants with the latest automation – not only to produce higher volumes of state-of-the-art pipe, but to keep up with demand in an era of deep shortages in the labor force.

"We're blessed to have absolutely incredible people working here. The problem is, we can't find enough good help," Washabaugh said. "We've been running shorthanded in all of our plants for four or five years. We're able to do that because of the exceptional staff that we have, but it's not fair to them to force them to work their tails off. So, anything we buy – it's not eliminating jobs – it's just replacing people that we can't find."

A Challenge

That kind of thinking put Northern Concrete Pipe on the front lines of automation, and it led them to challenge HawkeyePedershaab, an Afinitas company, to collaborate on developing new technology to further automate their plants when it was time for an upgrade. Afinitas is a global family of infra-



Newly installed HawkeyePedershaab Mastermatic XT150 at Northern Concrete Pipe's Grand Rapids, MI, plant.

structure equipment and services companies that serves the manufactured concrete products industry. The focus of Afinitas is to provide the machinery and technical expertise to further the evolution of the industry. The partnership between Northern Concrete Pipe and HawkeyePedershaab to upgrade Northern's Grand Rapids plant is a case in point.

Northern Concrete Pipe purchased the plant in 2012 toward the end of the Great Recession, and it came with a mid-1970s-era Transmatic pipe machine, which is the forerunner of the Mastermatic line of products that HawkeyePedershaab now manufactures. Consider the age of that equipment. When the Transmatic was installed in Grand Rapids, the inhabitant of the White House was Gerald Ford, a Michigan man and Grand Rapids resident himself. Let's just say the equipment was well seasoned when Northern took over the operation.

The plant also came with some key people, who were integral in working with the Afinitas team to design the new plant, according to Washabaugh. Charlie LaMange, plant manager, and Ben Stokes, maintenance manager, knew the Transmatic equipment inside and out. They were responsible for keeping it running, even though the technology might be generously described as antique. The machinery was holding up, although replacement parts sometimes had to be custom-fabricated and might take months to acquire. LaMange and Stokes and their crew found ways to keep it running.



The Mastermatic XT150 is a self-stripping machine and does not require an overhead crane.

"The overall machine was in pretty good shape," LaMange said, "but we had problems with the print card system that was the operating system for that unit. Each specific card has a function," he added. "It's technically digital, but we couldn't add on any functions. It's not like today's machines where you can program in something else. Overall, that machine functioned very well. It wasn't the problem – it was the operating system."

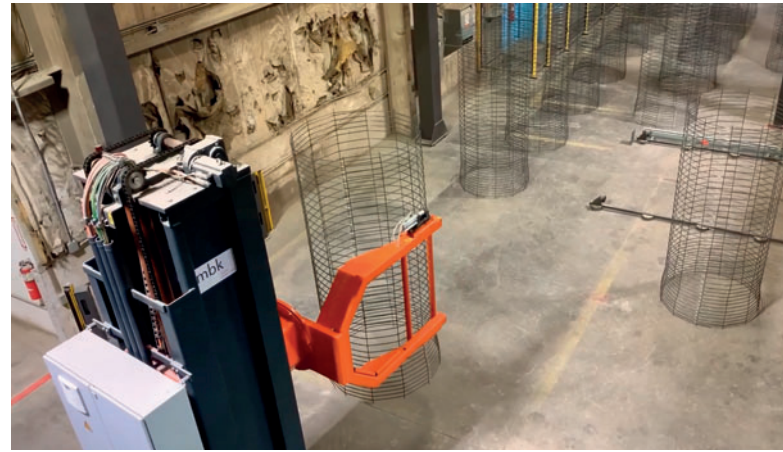
With their deep knowledge of the equipment, LaMange and Stokes were integral members of the team creating the new vision for the plant. It centered around replacing the classic Transmatic with the HawkeyePedershaab Mastermatic XT150, a fully automated rising core compaction pipe machine. The Mastermatic is a self-stripping machine so it doesn't require an overhead crane to demold the product.

HawkeyePedershaab's patented rising core feeds concrete into the mold at a 45% faster rate than conventional fixed-core vibration machines and demolds it 40% faster. But that was just the start. In addition to increased production capacity, Washabaugh and his team were looking at even more automation in the process, and they set out a vision for the HawkeyePedershaab design team.

Automation & Collaboration

"We asked them to do things they hadn't done before," Washabaugh said. The company had recently replaced three older mbk cage welding machines with a new mbk system. The goal was to seamlessly integrate the movement of the cages going into the HawkeyePedershaab system with the mbk system. It required programming the U.S.-based HawkeyePedershaab operating system with the German-based mbk. Afinitas is the exclusive representative of mbk in North America.

Jason Banwart, HawkeyePedershaab Director of Technical Sales, said his team was up for the challenge. "Northern came to us and said, 'we want a system where we don't have to



mbk robot handling of cage to the cage manipulator. The entire cage handling process is automated.

touch the cage from the time it gets made until it is cast into the piece.' That was kind of their big request, and our initial concept to them was basically delivering the cage on a conveyor just in time, where it gets cast into the piece," Banwart said. "But they wanted to have some flexibility to have a buffer zone, where if something paused in the machine production the mbk could keep running and producing cages. Or, if the mbk had to shut down, the machine could keep running and pull cages from that buffer zone. It was kind of that two-pronged request that drove the automation that we developed."

When it came to envisioning groundbreaking new technology for their plant, Washabaugh's long relationship with HawkeyePedershaab and their faith in their Grand Rapids managers gave them a level of confidence to push the envelope.

"We knew they could do it," Washabaugh said. "It was just a lot of meetings. Sitting down with their engineering staff and their installation staff and their salespeople. Because our



Pallet cart delivering the pallet and cage to the Mastermatic machine.



The automatic cage handling system saves labor and reduces safety risks from manually moving and lifting cages.

people knew that machine as good as anybody. They knew it inside and out. We made a list of 'here's what we want,' and started going through each step, solving issues with each one, coordinating timing and finally coming to an agreement," he added.

"We absolutely wanted something better than what we had," LaMange said. "The overall style of the machine is the same as the Transmatic, but we were also looking at the additional function of reducing our spacer usage by having cage positioners. We wanted something to be able to take cages directly from the mbk and place them all the way through the Mastermatic to pipe production, and have it come out the other side.

Health & Safety Benefits

"The idea was to have it all automated," LaMange added. With a shortage of available labor, the goal was to reduce the manual workload for plant personnel and increase output. Increased automation also brings added health and safety benefits.

"Before we were manually moving cages and lifting cages, so you have a reduction in the possibility of injury," LaMange said. "This was all pre-pandemic so it wasn't an issue then, but it has made a big difference right now." Maintaining a workforce has been even more challenging for manufacturers during the pandemic.

((Fig. 6)) Latest control technology minimizes the amount of labor needed to operate the machine and allows technicians to log in remotely to make any adjustments needed.

"It's not without its hiccups on occasion, but working with HawkeyePedershaab, we're a good tag team," LaMange said. "Their programmers are able to go in and adjust things to our preferences." Instead of trying to find a print card for the old Transmatic, the programmers can remotely log in and make adjustments. "They're able to see how our machine is func-

tioning on the other end," LaMange said. "They'll take our suggestions and make it work with their programs."

The result of the new configuration is a pipe operation that can run with one operator to monitor all the processes and one off-bearing operator to make sure the cages keep moving in and the pipe keeps moving out.

"To me, the exciting part about this whole project was the collaboration between Afinitas and mbk and Northern," Banwart said. "We needed to be able to communicate with the mbk machine so we would know when they produce a cage and where they place it, and then our robot comes in and moves it to the buffer zone. Throughout the whole process we had a series of meetings with the Northern team where we would



Offbearing device removing the pipe and placing it for transport to the kiln.

throw out a concept, they would come back with feedback, and we would go through another iteration and present it. This was definitely a request that pushed our limits and took our automation to the next level," he added.

If it's quality you want, there's nothing better than the pipes that emerge from the Mastermatic, Washabaugh said. "We knew we were going to make a step up in quality, and these pipes are just absolutely as good as you can make drycast concrete pipe. The compaction is consistent and uniform. We've had no quality issues whatsoever, and our daily output is not restricted by all the automation."

It's a cliché, LaMange said, but the difference in the operation at the Grand Rapids plant has been "night and day. It's just much smoother," he added. "You have far less physical labor. It's making a difference in our output. The guys are not having to work nearly as hard. You know, the old adage, 'work smarter not harder.' They're doing more now with their minds, controlling these machines and setting up programs versus having to do the physical labor of lifting cages and placing spacers."

Working Smarter

With no end in sight to the labor shortage, the "work smarter" trend is something that Afinitas is seeing throughout the industry, said Derek Von Cannon, Afinitas Vice President of Sales for the Americas. It is one of the hallmarks of the company, which was formed from five iconic industry brands – HawkeyePedershaab, BFS, CAM Products, New Hampton Metal Fab and Spillman Co.

"As we put Afinitas together, we want to be a cutting-edge, value-added resource for our customers, where we sit down with them, and it's not like we're selling them on our products," Von Cannon said. "It's that we're analyzing as a partner. We're putting together a partnership with each one of our customers that's going to give them the best of what they want. It's the partnership and the value, and how, with our partners, we're going to take the industry to the next level."

For Bill Washabaugh, it all goes back to people. Northern Concrete Pipe is planning to replicate the success of this project with bigger and better upgrades at its plants in Clarkston (near Detroit) and Charlotte (near Lansing).

"I can't emphasize enough how important it was for our key people – our plant manager and our maintenance manager – to be involved," Washabaugh said. "Their involvement with the design staff from HawkeyePedershaab is what made the project turn out as well as it did. Our two guys and their key people. We have a long history with Hawkeye, so we knew what they could do." ■

FURTHER INFORMATION



Afinitas
8040 Forsyth Blvd
Clayton, MO 63105 USA
T +1 314 862 8000
info@afinitas.com
www.afinitas.com



HawkeyePedershaab
506 S. Wapello St.
Mediapolis, Iowa, 52637, USA
T +1 319 3943197
F +1 319 3943977
info@hpct.com
www.hpct.com



mbk Maschinenbau GmbH
Friedrich-List-Straße 19
88353 Kisslegg, Germany
T +49 7563 91310
F +49 7563 2566
info@mbk-kisslegg.de
www.mbk-kisslegg.de