*by Abbe Miller, editor-in-chief*

# PRINTING PARTS

A national leader in mechanical contracting work takes a digital approach to producing the parts its customers need

Next year marks 100 years in business for A&R Mechanical Contractors Inc., one of the largest and most reputable plumbing, piping, ventilation and civil utility contractors in the Midwest. The company's progression over the past century has been impressive. What started in the home of founders Bud and Beatrice Reichard today spans multiple facilities in multiple locations in Illinois and Indiana.

The 100-year journey hasn't afforded the founders or those that came after them much idle time. Growing from a residential plumbing and heating business into an expert contractor providing engineering, consulting and construction services for some of the largest commercial and government projects in the Midwest doesn't happen overnight. It has been a journey of evolution and advancement with some of the most significant changes happening thanks to the adoption of new technology.

These efforts have resulted in A&R being named as one of the top specialty contractors nationwide by *Engineering News-Record*. Justin Powers, VDC/asset business unit manager at A&R, has been a key player in helping to transform the company since coming on board 13 years ago.

"We're trying to pull all of our operations forward and do everything as digitally driven as possible," he explains. "It makes for a faster, easier, cheaper and better product in the end."

## ALL IN THE FAMILY

From its initial founding in 1925, Beatrice Reichard was central to the company's early growth. She encouraged her husband, Bud, to get into the plumbing trade and kept their ever-expanding crew motivated and fed, providing lunch for everyone each day around their kitchen table. Her son, David, was also inspired and started D.W. Reichard Plumbing and Heating behind their home in Urbana, Ill. In the 1950s, David renamed the business David W. Reichard Plumbing and Heating and, knowing the opportunities it would afford the business, established the company as a union shop.

"We have a lot of people in leadership roles who have worked in the field, so they can be great advisors to our customers. They've turned the wrenches; they've measured the ductwork."

*Justin Powers, VDC/asset business unit manager, A&R Mechanical Contractors Inc.*

In 1966, David partnered with Ken Asklund, who was proficient in heating, cooling and control systems, and with the addition of sheet metal fabrication, the two men formed A&R Sheet Metal. This trend of expanding capabilities continued with another rebranding under their current name, A&R Mechanical Contractors. By 1986, Jon Reichard, Scott Reichard and Neil Asklund were at the helm, maintaining the two families' ownership. Two years later in 1988, a treasury stock sale commenced, which brought further development, growth and expansion.

With current locations in Urbana, Bloomington and Mokena, Ill., and West Lafayette, Ind., A&R's facilities span 45,000 sq. ft., including a sheet

*At A&R Mechanical Contractors' 20,000-sq.-ft. top-of-the-line pipe fabrication shop, a ProCutter from HGG Group processes the bulk of the company's tube and pipe material.*

techgen MEDIA GROUP

**To showcase the latest in digital advertising, Techgen Media offers a new portfolio of dynamic ad options. By leveraging advanced digital advertising, potential and existing customers are presented with new and exciting ways to engage with your brand.**

To see the new ads in action, check out our interactive brochure.

See the brochure

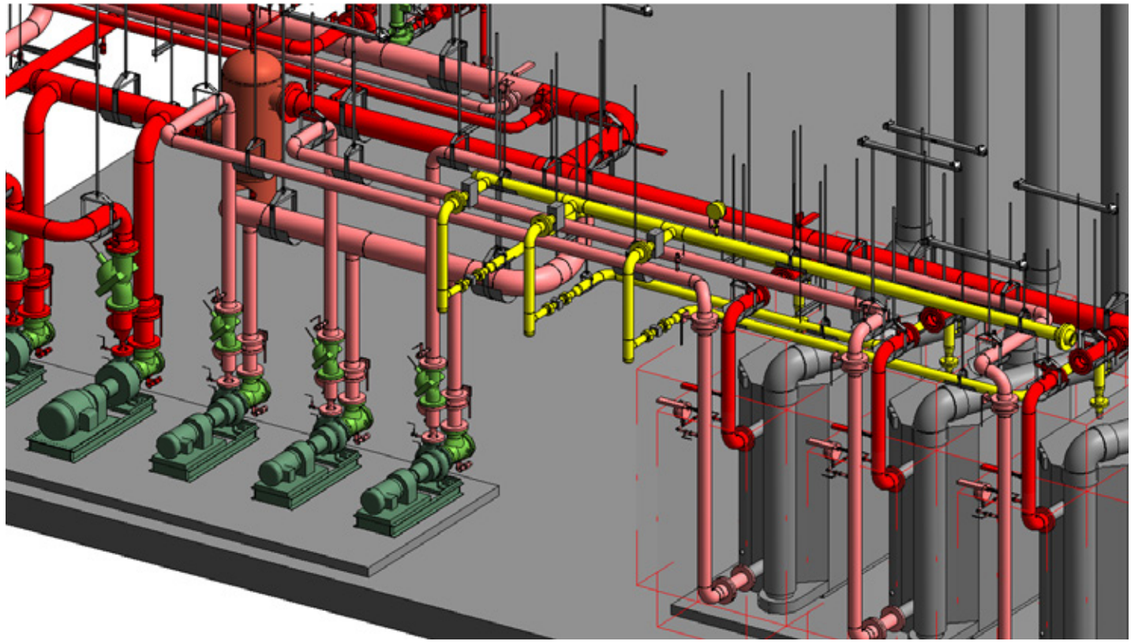
metal shop, laydown yard and storage facility as well as a 20,000-sq.-ft. top-of-the-line pipe fabrication shop. Across those facilities, up to 150 employees handle the full scope of customer needs – everything from new construction and renovation work to retrofitting, repair and maintenance. As its company name once evoked, A&R also provides the metal fabrication for all the jobs it handles.

To support a project from start to finish, A&R offers customers engineering and consultation services and provides service calls, if needed. Customers also have access to the company's virtual design and construction team – the VDC in Powers' title. With digitalization as a major component of the company's growth and success, the VDC team designs, plans and models projects

*As seen at Fabtech 2023, HGG Group's ProCutter all-in-one robotic plasma tube cutter and profiler is available in two sizes, both of which feature a small footprint.*

"In the past five years, we've put a tremendous amount of time, effort and money into the digital side of our business."

*Aaron Marsh, fabrication manager, A&R Mechanical Contractors Inc.*



*With digitization as a major company focus, A&R produced a custom-made plug-in to connect the Autodesk Revit software the fabrication team uses with the company's HGG ProCutter.*

in advance to avoid potential issues, reduce and eliminate waste, and increase overall efficiency out in the field.

## OPERATIONAL EFFICIENCY

Over the course of 100 years, word of A&R's quality work has traveled far and wide, but if you ask Powers, he'll say that new and return business is often based on the company's competitive prices. But he can be pretty humble at times. If low prices were the only driver for customers to flock to A&R, the company might not have made it to 100 years.

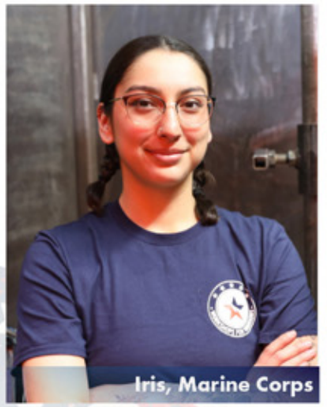
"Sometimes in this industry being the low bidder is what gets you the opportunity, but it's what keeps you there that matters, and our team brings value and solutions," he says. "Our customers appreciate our ability to understand their needs based on our extensive experience. We have a lot of people in leadership roles who have worked in the field, so they can be great advisors to our customers.


WORKSHOPS FOR WARRIORS®

Rebuilding American Manufacturing, One Veteran at a Time®

Bria, Marine Corps

Miguel, Navy


Iris, Marine Corps

Andy, Navy SEAL

Join our efforts to create a skilled workforce addressing America's shortage of 803,000 manufacturing workers.

Craig, Navy Veteran, Machining Graduate

*"I learned CNC machining at Workshops for Warriors, and now I'm not just a machinist, I'm an associate designer."*

**Workshops for Warriors** changes veteran lives by providing state-of-the-art training and job placement assistance for advanced manufacturing careers across the U.S.A.

1,125 Veterans Graduated

12,794 Nationally-Recognized Credentials Earned

94% Graduates Placed into Full-Time Jobs

Partner with us! Scan to learn how.

Thank You to Our Generous Supporters

Ford · RELIANCE STEEL & ALUMINUM CO. · BOEING

wfw.org | 619.550.1620 | 2970 Main Street, San Diego, CA 92113

*As shown here, the wide range of pipe cutting and profiling needs at A&R can be accommodated by the company's HGG ProCutter.*

They've turned the wrenches; they've measured the ductwork."

As a United Association Pipefitter for 17 years, Powers definitely fits that mold. As does Aaron Marsh, A&R's fabrication manager, who has been a United Association Pipefitter for nearly 20 years. Marsh says that beyond the team's lengthy tenure in the industry, investments in cutting-edge technology also help to secure new and returning customers.

"In the past five years, we've put a tremendous amount of time, effort and money into the digital side of our business," he says. "In the pipe fabrication shop, parts basically get printed out of the computer, for lack of a better way to describe it."

But Marsh's description is accurate. Compared to how the company historically produced parts, today, it is a highly digital process that creates essentially zero scrap along the way.

"We used to have warehouses full of material," Powers says. "The theory was that we could save it and use it on another job, but obviously, there's a cost involved for all that storage.

"Now with this digital workflow, we're able to develop materials that go to Aaron's team that are so accurate that when he buys material for each fabrication package, it shows up, they build it and, ideally, there's nothing left over and nothing missing," he adds, "which means there's no storage and no restocking."

## EFFECTIVE EQUIPMENT

Those printed parts, as Marsh describes them, are coming off a ProCutter 600 advanced CNC pipe cutter and automated tube profiling machine from HGG Group, which specializes in the manufacture of 3-D profiling equipment. The equipment was acquired to continue the journey toward increased productivity and accuracy and reduced material waste and handling. It replaced a handmade table the company used to manually lay out cuts made with an oxygen and acetylene torch.

"Workflow improvements, including nesting and optimizing cuts, improved accuracy and more productivity, came

pretty quickly," he says. "We were also able to download files from our in-house VDC department directly to the ProCutter and cut predetermined packages. It was a major upgrade."

Rounding out the investment, A&R added a roller gutter and infeed conveyor to expand the ProCutter's capabilities. With the roller gutter system, the machine can cut pipe up to 18 in. in diameter and 21 ft. long. With the pipe trolleys, it can process up to 24-in.-dia. pipe at 21 ft. long. While the company typically processes material between 2.5 in. and 12 in. in diameter, the additional capacity is useful for larger and more complex projects. Schedule 40, 80 and extra-heavy thicknesses are also possible on the machine.

Compared to the ProCutter's traditional pipe trolley stand, the addition of the infeed power conveyor and roller gutter setup have been fruitful for A&R. The infeed conveyor not only feeds raw pipe into the ProCutter, it also dispenses the cut pieces onto an attached table for prep and welding. The roller gutter system keeps cut pieces from falling and removes the need for a dedicated overhead crane or hoist for the cutting operation, improving worker safety and efficiency.

If the pipe trolleys are needed – such as for large customers that have bigger mechanical system requirements – a crane or hoist has to be used. But, in those rare instances, Marsh says it's, of course, better to have the option of saying yes to that work than to pass on it.

## BIG BENEFITS

Since investing in the ProCutter, A&R has cut the time to process pipe in half. What used to take 30 hours a week now takes 15 and sometimes only 10 hours. And that can be accomplished with just one employee. For context, the amount of material coming off the ProCutter can keep five welding booths sufficiently busy throughout the work week – and that's for just-in-time fabrication with no need to store any cut pieces.

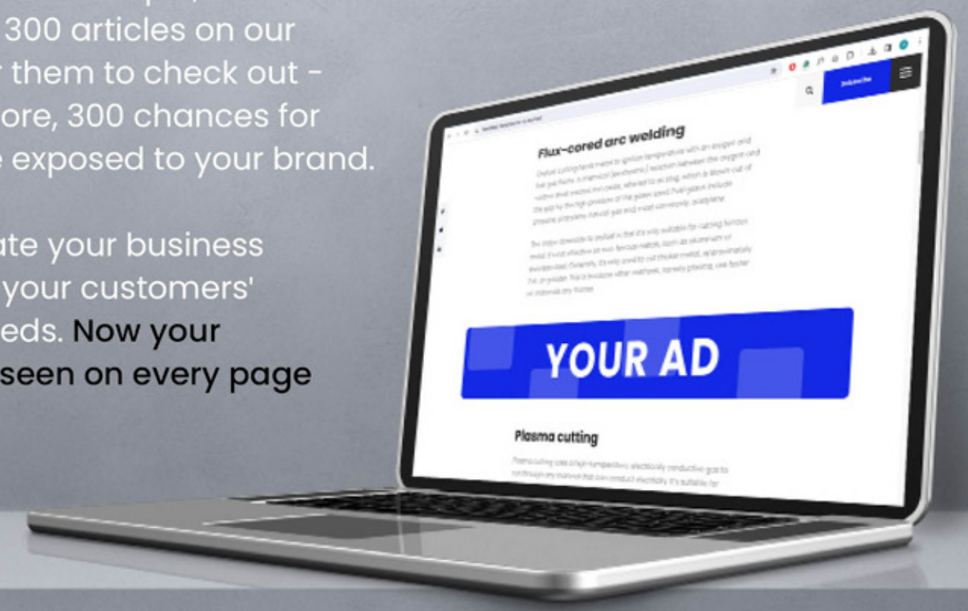
But it's not just the cutting process time that's been slashed in half; programming and training times have


TECHGEN media

Place your ad where your potential customers are reading with a **Techgen Category Sponsorship.**

If your customers are involved in welding, for example, we have more than 300 articles on our website for them to check out - and, therefore, 300 chances for them to be exposed to your brand.

You dedicate your business to cater to your customers' specific needs. **Now your ad can be seen on every page they read.**




Choose from 57 manufacturing categories

| | | | | |
|---|---|---|---|---|
| Stamping | Plasma | Blanking | Aerospace | Energy |
| Welding | Oxyfuel | Tooling | HVAC | Agriculture |
| Lasers | Waterjet | Sawing | Shipbuilding | Structural |
| Press brakes | Tube & Pip | | Automotive | White Goods |
| Robotics | Software | Quality Control | Infrastructure | Medical |
| Automation | Abrasives | Oil & Gas | Alternative | Electronics |

Learn More

been dramatically cut, too. Marsh says that an experienced operator can train a new user to operate the machine effectively, accurately and safely in about one hour.

In terms of programming, A&R utilizes Autodesk's Revit software for the company's work and maintains its own fabrication database, which gives the team the ability to customize a job's parameters to influence the results they need from the ProCutter. Staying true to their digitalization ambitions, A&R produced a custom-made plug-in to connect Revit to the HGG equipment.

"Once the pipe is signed off, we use the Revit plug-in that we built to export PCF files," Powers says. "The tool has the ability to customize names, provide custom over-sized branch outlet holes and automatically filter out any smaller bore pipe that can't be cut on the machine.

"Once we have the PCF exports, they're placed on a shared network drive for the operator to pick up for nesting and profiling," he adds. "This is accomplished with Pypeserver software running on the HGG gantry computer. Nesting is completed and imported to ProCAM for profiling, allowing us a workflow that utilizes Pypeserver's 'last cut in chuck' feature and saves countless dollars in material.

"This optimized workflow is so much more efficient and accurate because when we were doing a lot of hand drawings from the field, the guy that was doing the manual oxyfuel cuts also had to do the math," he adds. "This is another example of how digitalization – beyond the equipment itself – can reduce the time it takes to complete projects for our customers."

On top of that, the ProCutter's graphical interface control makes it easy to program a part even if the operator doesn't have a 3-D drawing for it. Marsh says that working without a CAD file isn't necessarily rare in their line of work.

"The shop operator can do this easily directly on the HGG machine," he says. "This is how we handle hand-generated drawings that aren't modeled using Revit. The pipe fabrication shop calculates the lengths needed based on that drawing and inputs the size, wall thickness, lengths and holes per piece directly using the HGG-provided software. Once an operator gets the hang of it, it's a really quick process. ■

*Watch the video to learn more about the ProCutter 900 from HGG Group.*

A&R MECHANICAL CONTRACTORS INC.

HGG GROUP