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By Cory Dellenbach

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California Boring founder Kevin Reardon (left) and his son, Mike, a project and operations manager, pose for a photo in front of the company's Vermeer D24x40 Series II NAVIGATOR directional drill at their facility in Anaheim, California. The company is one of the state's largest horizontal drilling specialists with 13 directional drills in its fleet. (Photography by Collin Chappelle)

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NEVER IN MY WILDEST DREAMS

DID I THINK I WOULD OPERATE AN EXCAVATOR, FRONT LOADER, SKID-STEER OR GRADER.

Trying Something New starting a new business or operating new equipment can be scary at first, but with patience it can be beneficial

BY CORY DELLENBACH, EDITOR

rying something new is always a little scary, whether starting a new business, expanding the business in some way or testing out new equipment you've never had before.

In late April I was offered the chance to try something I never thought I would get to do — operate heavy machinery. Never in my wildest dreams did I think I would operate an excavator, front loader, skid-steer or grader.

Many who read this magazine operate these and similar machines daily and are comfortable with them. However, the largest vehicle I had driven before running this stuff was a U-Haul truck.

I attended an equipment debut of new excavators from CASE Construction at its Customer Care location in Tomahawk, Wisconsin. It was a huge facility with almost every piece of heavy equipment out there that the company manufactures. After the customary debuting of the equipment with a press conference and handing out of press releases, the CASE folks turned the media loose to test our skills.

We were allowed to climb aboard any piece of equipment in the yard and try it out. I started off small, going with the skid-steer. While nervous, I thought I could handle it better than some bigger machine.

I then decided to brave a front loader. Of course they put me in the biggest one on site, the CASE 1121F. It's intimidating just looking at it from the ground, and now I was going to drive it around and try and pick up dirt with it.

Yes, I was a nervous wreck, but after awhile the nerves wore off and I was feeling more comfortable. I imagine this is how many of you felt the first time you took the controls of heavy machinery, or when you started up your business.

FROM THE GROUND UP

Someone who knows what it feels like to start a business from scratch is Kevin Reardon. Reardon was just a young man when he launched his business, California Boring, profiled this month. Reardon started by offering saw cutting and pulling a trailer behind his truck.

Now, 20-some years later his business has sprouted

up to become one of the largest in Southern California to offer directional drilling, potholing, locating and other underground construction services.

Reardon says it took him awhile to learn the market and how to run a business, but he didn't give up and has turned it into a successful endeavor. He's even expanded the business by starting two subsidiaries that work along with California Boring on job sites.

KEEP UP ON MAINTENANCE

It's midsummer and you're in the thick of construction season. You're keeping your equipment cleaned and checking it over to make sure it keeps operating at peak performance, right?

Our Machine Shop in this issue focuses on your directional drilling equipment and what you should be doing with it to keep it going for as long as possible.

DOWN AND DIRTY

Are you running into any tough directional drilling jobs? How about challenging hydroexcavation, trenching, bursting or tunneling jobs?

We want to hear about those tough jobs and share them with other readers. Tell us about your tough jobs and how you were able to complete them successfully. Email me at editor@digdifferent.com or call me at 800/257-7222. ▼



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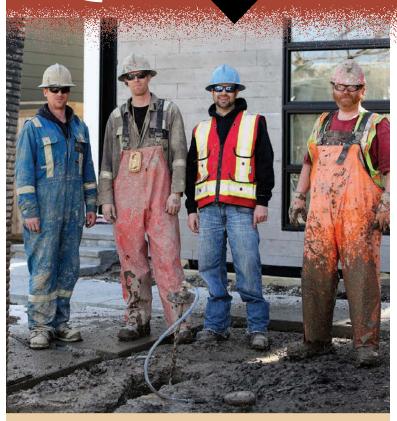
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There are more than 50 hydroexcavation machines in operation in Calgary, most of them owned by two large companies. Competing against the big boys sometimes takes a group effort. With just seven employees, Allstar Hydrovacing often relies on the help of other smaller contractors — sometimes teaming up on jobs — and is always willing to return the favor when needed. **digdifferent.com/featured**

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OVERHEARD ONLINE

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Hydroexcavation Company Expands Into Cleaning Services digdifferent.com/featured

NEXT GENERATION

Industry Readies Tomorrow's Trenchless Pioneers

The largest conference in North America dedicated to trenchless technology was a hit among the 11 student chapters that participated at the NASTT No-Dig



Show in Denver earlier this year. From education to networking, activities for the 67 college students in attendance were tailored to exposing the next generation of engineers and contractors to the wonderful world of trenchless. **digdifferent.com/fectured**

<u>CREATIVE APPROACH</u> Contractor Saves Project Owner Millions

Learn how Garney Construction's alternate proposal led to nearly \$10 million in savings on the Southern Delivery System, one of the largest water projects in the western United States. The mile-long, single-tunnel bore under Interstate 25, two rail lines, and environmentally sensitive Fountain Creek, was the critical piece in a 50-mile pipeline that will transport water from the Pueblo Reservoir to Colorado Springs and neighboring communities.

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Directional Drilling Drofile

BUILDING ANETWORK

California Boring crew members detach the Vermeer D24x40 Series II NAVIGATOR directional drill from the newly pulled pipe and prepare for the next bore by widening the access pit in a dense residential area of San Diego as part of a significant pipe replacement project. CALIFORNIA BORING AND ITS SUBSIDIARIES WORK TOGETHER TO SERVE CUSTOMERS ON ALL ASPECTS OF TRENCHLESS CONSTRUCTION

STORY: CORY DELLENBACH PHOTOS: COLLIN CHAPPELLE

When Kevin Reardon started California Boring 20 years ago, not many people knew about directional drilling and other trenchless technologies. Reardon learned on the fly along with the rest of the market.

"It has evolved immensely," Reardon says. "When directional drilling first started, it was basically used for telephone and street light installation. Now we're doing gas and electrical work."

Reardon's company has also evolved, starting with saw cutting and evolving into directional drilling. Now, thanks to several subsidiaries, the company can undertake almost any underground construction job, from auger boring to sewer inspections.

The company has grown to 50 employees and 13 directional drilling machines — becoming one of the largest contractors in the state offering the method.

"We serve all the directional drilling and auger boring needs for contractors in California," Reardon says. "We also do underground services such as

sewer locating, potholing and anything to do with underground construction and utilities. Our main focus is on boring, though."

STARTING SMALL

Reardon launched the company in 1993 as a concretecutting company when he was just 20 years old. "Originally I was doing saw cutting for pipeline companies and pulling a trailer behind my truck," he says.

He quickly saw room for growth after several pipeline companies asked him if he would do directional drilling.

With the help of his father, Reardon bought his first drill rig in 1995. "We started with one drill rig, and we had some pretty patient customers at that time," he says. "We basically learned on our customers' jobs."

"WE STARTED WITH ONE DRILL RIG, AND WE HAD SOME PRETTY PATIENT CUSTOMERS AT THAT TIME. WE BASICALLY LEARNED ON OUR CUSTOMERS' JOBS." Kevin Reardon



Johnson, office manager; Sydney Zemel, payroll/accounts receivable admin; Sarah Gutierrez, president, California Boring; and Kat Gerado, accounts payable admin. Middle row, Mike Reardon, manager, California Auger Boring; Mike Selvaggio, manager, California Locating Services; Duke Aipa, estimator, California Auger Boring; Kevin Reardon and Nick Rossi, estimators, California Boring; and Art Gutierrez, safety manager. Back row, Zak Poirer, administrator; and Travis Cerny, manager of underground division.

California Boring's 13 rigs are all manufactured by Vermeer. The inventory includes a 9x13 machine, a 20x22, two 36x50s, eight 24x40s and one 100x40. "Vermeer equipment has been durable over the years," Reardon says. "We get pretty good support from them. They work well with us in taking care of our needs."

Typically, 10 crews are out each day for directional drilling throughout the state.

"We provided and fused the 28-inch HDPE pipe, installed the multiple HDPE innerducts, dug bore pits, did the HDD and used a specific thermal resistive grout for the inside annulus of the casing," says Mike Reardon, project manager for the company. "We then backfilled the bore holes and left the pipe exposed for the customer to run their lines."

California Boring did seven canal crossings and worked through challenging soil conditions. "On this project we dealt with a reactive clay soil that had expansive properties," Mike Reardon says. "Sticky clay conditions like this make large HDD bores challenging because you have to break up the clay enough to be able to transport the cuttings out of the bore hole."

The clay becomes problematic when crews try to recycle the material. "We

TACKLING THE TOUGH BORES

A statewide service area brings plenty of job variety. One of the company's toughest was working on a solarpower project in Calexico, for Abeinsa

Abengoa at the Mt. Signal Solar Project. Abeinsa Abengoa hired California Boring to complete the underground canal crossings; when it was determined that regular excavation would not be allowed, directional drilling became the best option.

Crews were installing high-density polyethylene conduit with innerduct placed inside, surrounded by a special thermal resistant grout to stop it from heating up.

"WE WANT TO KEEP OUR PEOPLE AND KEEP THEM HAPPY,

ESPECIALLY SINCE WE PUT SO MUCH TIME AND TRAINING INTO THEM. WE FEEL WE HAVE THE BEST DRILLERS AND LOCATORS AVAILABLE." Sarah Gutierrez

want to recycle it so we can reuse the bentonite for the reaming operation," Mike Reardon says. "With the help of Vermeer's 9x12T recycling unit, we were able to process the material and pull in all the bores with no problems." Crews finished the project in three months.

Soil conditions are just one factor directional drilling contractors must look at when heading into a job. Others include existing utility locations, access to water and job layout. "We need to know where we're going to set the drilling equipment as opposed to where the pipe is getting pulled in from," Kevin Reardon says. "With directional boring, you're trying to basically avoid disrupting the flow of traffic as much as possible, leaving driveways open, trying to get the conduit into the ground without impeding the general public."

WELL-TRAINED CREWS

Helping to get those tough jobs completed safely is the crew of California Boring. "Our employees are well trained, and they're very safety conscious," says Sarah Gutierrez, company president. "Our guys have the ability to think on their own and make their own decisions to get the job done safely."

At the start of each job, crews complete a job safety analysis that covers the project details and safety considerations of the site. "If they have two or three jobs a day, they're going to have two or three of those safety analyses to complete," says Art Gutierrez, safety manager. "We'll then review them for accuracy."

New crew members are required to complete a boot camp where they learn how to operate equipment and tools, and where they receive their initial safety training.

"Once they complete that, they come to us and we have them go through our required safety orientation," Art Gutierrez says. "Drillers and locators also go through a session on safe operation and maintenance of Vermeer drilling equipment."

California Boring operator Eddie Viramontes guides a Vermeer D24x40 Series II NAVIGATOR directional drill from an access point in the street to a pit alongside a home.

Specialized equipment for specialized work

With many facets to the company, California Boring officials can't just pinpoint one tool that makes the business go. On the directional boring side, owner Kevin Reardon says the Vermeer D24x40 Series II NAVIGATOR horizontal directional drill is the winner: "It's our bread-and-butter, our preferred equipment of choice, because it is so versatile."

The D24x40 delivers 4,000 ft-lbs of torque and 24,000 pounds of thrust. The machine has a minimum bore diameter of 3.5 inches and a semi-automated rod loader.

On the California Locating Services side, the company's IBAK lateral launch van is its key piece of equipment. The unit carries a mainline inspection camera carrying a second camera that enables inspection of laterals from the main. Onboard monitors let crews watch and record the inspections from within the truck.

For its auger boring subsidiary, the 24-inch McLaughlin On Target 360-degree Steering System is the company's workhorse. "It allows us to guarantee line and grade on critical bores, eliminating the need of a pilot bore. Saving time and ultimately money," Reardon says. "It can be set in a small pit, so it's less disruptive to the job site."

For potholing, California Boring uses an 800-gallon vacuum system from Pacific Tek. "We also have some home-built units that work real well that are mounted on back of a truck with a core drill set up on it," Reardon says.



"WITH DIRECTIONAL BORING, YOU'RE **TRYING TO BASICALLY AVOID DISRUPTING THE FLOW OF TRAFFIC** AS MUCH AS POSSIBLE, LEAVING DRIVEWAYS OPEN, TRYING TO GET THE CONDUIT INTO THE GROUND WITHOUT IMPEDING THE GENERAL PUBLIC." Kevin Regrdon

Once trained, the company rewards its employees for being safe by having parties and barbecues throughout the year. "Our people stay. They don't come and go," Sarah Gutierrez says. "We want to keep our people and keep them happy, especially since we put so much time and training into them. We feel we have the best drillers and locators available."

MORE THAN BORING

California Boring offers more to its clients than just directional boring: The company has an entire underground division.

"A majority of our clients do possess these capabilities, so we are very careful to never vie for opportunities against them," Kevin Reardon says. The company offers vacuum excavation through its underground division, as well as asphalt and concrete restoration, engineered shoring pits and general labor.

The company also has two subsidiaries: California Auger Boring and California Locating Services. California Auger Boring, owned by Kevin Reardon, launched in 1995; California Locating Services, owned by Sarah Gutierrez and Kevin Reardon's wife, Jennifer, started operations in 2010.

"Before directional boring, there are a lot of things that need to take place on a particular project," Kevin Reardon says. "What we'll do is meet the customers, walk the project and then send out the locating service. We'll send out the saw cutter to cut the pothole location, and then the vacuum excavator to pothole for utilities."



California Boring's Todd Minkey uses a Digital Control Incorporated DigiTrak F5 to help guide the directional drill toward the access pit.

Once those steps are completed, California Boring comes in to place the pipe. To handle maintenance and repairs on all the equipment, California Boring has its own crews that can travel if needed. "We have four mechanics in our shop, and they are mobile," says Sarah Gutierrez. "If we have something break down on a job site, we can dispatch a mechanic. It's one of the many ways we are set up to make it more efficient."

Sarah Gutierrez is excited to see where the company goes from here. "Kevin has done a great job and

has a lot of respect in this industry from being in it so long," Sarah Gutierrez says. "He had a vision for this company when he started, and now here we are. Now we're serving customers the only way we know how — the best way." **•**

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10 Tips for Maintaining Your Directional Drill

KEEP THESE SUGGESTIONS IN MIND AS YOU PREPARE FOR YOUR NEXT PROJECT

BY KYLE ROGERS

irectional drilling goes back nearly a century when the oil and gas industry developed the process to allow multiple wells to be established from a single bore. Today, advances in technology have allowed the process to become the go-to solution for situations when trenchless isn't just the preferred option — it's the only option. Here are some tips to help keep your directional drill in top shape for its next project, and many more to come:

ROTATE YOUR DRILL PIPE

"Drill pipe is probably the most wearable item on a directional drill," says Barry Jackson, HDD product training manager for Toro. "Drill pipe is not super expensive, but just keeping your pipe serviceable is important because it can make or break a directional bore."

To help extend the pipe's service life, Jackson recommends rotating it throughout the drill string.

"Instead of starting with the same piece of drill pipe every single time, you should rotate it throughout the string so that every piece of pipe gets even wear," he says.

USE DRILLING FLUID

"Drilling fluids will greatly reduce the amount of wear on the drill pipe, as well as the tooling on the bottom of the drill string," Jackson says. "There are some in the industry who believe just

because it's a 100-foot bore as opposed to a 1,000-foot bore, they can do the project without drilling fluids. Or they've always worked without drilling fluids and will continue to do so. But that wears out the equipment. Things don't last as long as they would for someone who actually uses the proper fluids to do a project."

How much of a difference can drilling fluid — or "mud" as it is referred to in the industry — make? Jackson estimates that an operator can expect to see about 20 percent more life out of a drill by regularly using fluids. For the life expectancy of the tooling going into the ground, it is particularly crucial. "I would say at least 50 percent more life," he says.

KNOW THE GROUND CONDITIONS

It can be difficult to properly maintain equipment if it's not even well suited for the job. Selecting the right tooling and fluids for a directional bore will not only help operators complete a job successfully but also minimize the amount of wear on equipment.

"Of course you don't want to use a bit that's designed for dirt to drill through rock," Jackson says. "Choose the right tools for the job and that will absolutely help the drill withstand the wear and tear."

And the mud formula may have to be adjusted from job to job, as well.

A DD2024 directional drill from Toro installs pipe along the side of a road. Directional drills, with all the moving parts on them, need to be well taken care of to last a long time for contractors.

"IF YOU SEE A SPIKE IN MUD PRESSURE, YOU HAVE TO ASSUME THE TOOLING IS **PLUGGED OFF."** Jaime Wines

"The variables can be extreme," Jackson says. "You may have sand that's super abrasive in one area and you'll have to use a specific type of drilling fluid that reduces friction in that bore, and in a completely different bore you may not have any friction whatsoever. Yet you still need to add some type of slick properties to that drilling fluid in order to, for example, keep the drill pipe from sticking to a clay formation."

If the machine's gauges are showing excess rotary torque, it could be a sign the wrong type of fluid is being used, Jackson says.

USE QUALITY MAKEUP WATER



You may have selected the right formula of drilling fluid for the job, but if you're not careful about your water source, you may still find yourself vulnerable to potential equipment damage.

"Chances are operators are pulling the water out of a fire hydrant or a creek," Jackson says. "If the fire hydrant has sat dormant for a while and has not been flushed, they will get a ton of sand that has settled in those lines going directly into their mixing tank. That sand then gets mixed up in the drilling fluids and runs through the mud pump. If they're pulling out of a creek, they need to make sure they're using a strainer system for that water before it goes

into the tank. Otherwise you end up with pebbles, small rocks and larger grains of sand in the mud system, and those will get pumped through the mud pump also."



MAKE SURE DRILL OPERATORS ARE PROPERLY TRAINED

"Help avoid drill damage by ensuring your operators are properly trained and are familiar with the limits of a drill and the drill

pipe," Jackson says. "Staying within those limits on a drift and the drift too fast will help prevent pipe from coming back bent, or pipe that doesn't come back at all."

TROUBLESHOOTING TIPS DURING OPERATION

Preplanning is key in directional drilling to avoid any problems in the field. But issues can arise, and often times the cause can be plugged tooling. One example of

something to look for mid-bore is a loss of cuttings, says Jaime Wines, HDD tooling product manager for Ditch Witch.

"If nothing is coming back, your tooling may be plugged off," she says. "If you see a spike in mud pressure, you have to assume the tooling is plugged off. Another indicator something is wrong is if the beacon or sonde gets a reading that's pretty hot. That's another sign that the tooling is probably plugged off."



CLEAN TOOLING REGULARLY

"I think it's a good practice to clean off your tooling when you pull it out. It will help your tooling last longer," Wines says.



PROTECT THREADS

Along with consistent cleaning, Wines recommends protecting all threads on the equipment.

"The threads need to be protected, whether they use a thread cap or a lot of time you'll even see people use tape. Anything they can put on them to protect them from gouging," she says. "A lot of times, they'll just throw them in the back of the trailer at the end of the day, which is fine, but first clean them off, tape them up or use the plug. Make sure you're protecting those threads because they will last longer, and any time you have thread damage it's damaging anything it's connecting to down the drill string."

WEAR ON DRILL BITS

A common issue seen is operators not replacing the teeth on a drill bit soon enough.

"The more you keep those teeth in good shape, the more productive the drill is going to be for you," she says. "Just watch those teeth and make sure they don't get too much wear on them."

PREJOB INSPECTION

The prejob inspection is particularly important in directional drilling since an equipment malfunction during a bore can

mean having to start over at square one. On that inspection checklist should be items such as ensuring that all connections are tight and looking for hairline fractures or signs of excessive wear on tooling.

"If there's a fracture on the tooling or if something is not tight, you could lose your bit downhole or the

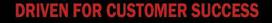
"HELP AVOID DRILL DAMAGE BY **ENSURING YOUR OPERATORS ARE PROPERLY TRAINED** AND ARE FAMILIAR WITH THE LIMITS OF A DRILL AND THE DRILL PIPE."

Barry Jackson

tooling could break," Wines says. "It's important to catch these things above ground because once you're down-

pround because once you're downhole if there's a breakdown: 1.) You don't know exactly what happened. And 2.) It's very difficult to get these things out and still utilize that hole. A lot of times you have to start over. Thousands of dollars are at stake." ▼

See more on directional drilling maintenance online at digdifferent.com





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Welcome to the US

PARTNERSHIP ENABLES CANADIAN COLD-WEATHER HYDROEXCAVATOR MANUFACTURER TO FIND NICHE IN THE STATES

BY CRAIG MANDLI

oremost has long been known in Canada for durable, cold-weather-ready hydroexcavation systems. Now, thanks to a partnership with Coloradobased heavy truck distributor Transwest, the units are easier to find in the U.S.

The Foremost 1600 Hydrovac, with its distinctive doghouse, drew plenty of onlookers at the 2015 Water & Wastewater Equipment, Treatment & Transport (WWETT) Show in February.

"The 1600 is designed to work effectively in temperatures down to minus 40 degrees," says Tim Dell, vacuum systems sales manager for Foremost. "Not only is the doghouse insulated and heated, all external valves are too. The heating options are a must in most Canadian climates, and we think this unit is going to be a good fit for the northern states in the U.S. as well."

The 1600 allows for water capacities of 1,600 gallons and a 13-yard debris body. Vacuum power is supplied by the Robuschi RBDV125 blower. The Cat 3560 wash pump and 740,000 Btu boiler are also used on this model. The boom is rear-mounted, 8 inches in diameter, fully rotational and controlled by an Omnex wireless controller, which also controls the vehicle rpm, wash and vacuum functions. All off-loading functions can also be performed via the remote.

"The remote functionality enables one person to operate this unit if needed," says Dell. "That saves on manpower costs, making the unit more appealing to municipalities and private contractors."

"THE **REMOTE FUNCTIONALITY ENABLES ONE PERSON TO OPERATE THIS UNIT** IF NEEDED. THAT SAVES ON MANPOWER COSTS, MAKING THE UNIT MORE APPEALING TO MUNICIPALITIES AND PRIVATE CONTRACTORS." Tim Dell

Off-loading is performed via a sloped debris floor design and washout system. The dump door is 48 by 58 inches, providing a large area to allow for tank cleaning. Optional 4-inch Hydratech off-loading pump systems are available, which allow for pumping off in a contained manner when discharging liquid loads.

Dell recommends the 1600 for municipal and industrial settings, and its smaller footprint also makes it an ideal fit for remote mining and utility operations. While its smaller van body sacrifices some heated storage, it means a more maneuverable, versatile unit.

"It's definitely going to appeal to the subcontractor who performs municipal work every day," says Dell. "It is designed as a workhorse, and can fit the industrial oil and gas and utility markets as well."

Foremost's partnership with Transwest allows the heavy truck distributor to leverage its marketing and sales expertise to sell Foremost hydrovacs to U.S. customers. According to Dell, the 1600 is the focus of the initial marketing campaign, with more to come in the future.

"Partnering with a company like Transwest that understands the U.S. market is big for us," he says. "Canada has a more mature hydroexcavation market than what you see in the states. We are already seeing increased interest, Tim Dell, left, vacuum systems sales manager for Foremost, points out the heated and insulated doghouse and heated valves on the 1600 Hydrovac. The unit is designed to operate effectively in temperatures as low as minus 40 degrees.

and that's causing us to take a look at what we're offering in the U.S."

Next year, Dell says he hopes to bring several of Foremost's hydrovac options to the WWETT Show, including a model with fewer heating options designed for the southern states, and a miniature "urban" model offering even more maneuverability.

"Judging by the response I've seen at the 2015 show, we're definitely coming back bigger and better," says Dell. "Hydroexcavation is really starting to take off in the U.S., and we're going to be involved."

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HURK-ulean Task

PIPE RAMMING CONTRACTOR HURK UNDERGROUND TECHNOLOGIES OVERCOMES VARIOUS OBSTACLES TO COMPLETE CULVERT PROJECT

The crew had to manually remove

during the 180-foot pipe ramming

pieces of pier repeatedly encountered

BY MATT FUESTON

s an underground trenchless technique for installing and replacing culverts, pipe ramming is often the most efficient and economical. At times it may be the *only* feasible option. Such was the case in a southern Illinois railroad culvert installation in flooded ground conditions.

CN Rail Line contracted HURK Underground Technologies of Grinnell, Iowa, to install two 180-footlong, 60-inch-diameter culverts using pipe ramming beneath the railway in Cairo, Illinois. The culverts were designed to relieve an existing, partially collapsed, 48-inch steel culvert with reduced capacity.

Work began in November 2013. From the start HURK was faced with daunting obstacles. For one, the job site was in extremely wet ground conditions far from the access road.

"This was the most difficult ram the company has performed," says Jason Pollock, HURK's director of ramming operations on the project. The project was difficult because of the size and length of the ram and also from complications from subzero temperatures, inundated ground conditions and unexpected obstacles inside the railway substructure.

EQUIPMENT AND CASING

In addition to a 350-series excavator used to create the working pit, HURK brought to the job site a mini excavator, track loader, horizontal drilling machine with 48-inch-diameter posthole auger, 1,300 cfm air compressor, adjustable pipe stands, and 24-inch pipe ramming hammer from Hammer-Head and appropriate tooling for 60-inch pipe.

project.

The new casing consisted of 30-foot lengths of 0.875-inch smooth wall steel pipe for new culverts set 2 feet apart from each other at an elevation 40 feet below the rail bed.

SITE PREPARATION

Staging the equipment and setting up the access pits was the first problem



PROJ	ECT:	Installing and replacing culverts
CUSTO	OMER:	CN Rail Line
CONT	RACTOR:	HURK Underground Technologies (Grinnell, Iowa)
EQUI	PMENT:	HammerHead pipe ramming hammer HammerHead Trenchless Equipment 800/331-6653 www.hammerheadtrenchless.com
RESU	LTS:	Installed both culverts without having to dig up railway
DIR'	TY≣	

to overcome. Both sides of the roadbed were wetland areas. Only a mile-long drive across cropland Pollock described as "soupy" could be used to get to the installation site. To get to and from the site, HURK used its tracked equipment to pull the company's trucks across the field most days.

The surface of the railroad bed was about 40 feet above the culvert insertion point. This job site scenario, known as "high fill" or "deep cut," is diffi-

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HURK crew begins restoration of finished installation.



Crew must remove a 5-foot-diameter tree stump buried during original construction of railway substructure.

cult to survey. The spot chosen for the installation allowed HURK to stage its equipment just above water. The soggy ground conditions, however, presented another problem. The HURK crew tried to dig a 60-foot-long, 30-foot-wide working pit to a vertical depth of 10 feet at the toe of the railway berm. With each attempt, the pit's sides repeatedly collapsed, filling the excavation with mud and frustrating the crew.

Pollock and his crew hit upon the strategy of digging just half of the working pit 3 feet lower than the intended working grade. They immediately filled the excavation with 3-inch rock, setting sump baskets in the backfill. Then they quickly excavated the other half. The trick worked. With diesel-powered pumps in the sump baskets dewatering the first half of the pit, they were able to finish the pit to full size.

Once pumping operations started, all six 190 gph pumps ran continuously for four months through project completion, including weekends and Thanksgiving and Christmas work breaks.

Overcoming these complications at this location had taken the crew a week longer than usual to complete the working pit.

RAMMING PROCESS

The excavation's size allowed HURK to install both culverts from a single working pit. Each section of casing required the crew to attach the hammer to it, ram the pipe into the berm at about a 2 percent grade, detach the hammer, weld on the next section of pipe, reattach the hammer and continue ramming. Two welders could complete the root weld and fill passes on the largediameter pipe to industry specification usually in less than five hours.

Ramming progressed at about 6 inches per minute while the hammer was operating.

MORE OBSTACLES: TREE STUMP AND PIERS

Pollock says that whenever pipe ramming progress drops to less than 1 inch per minute, he believes the pipe is cutting through tree roots or rock, or is pushing an obstacle out of the way.

"So when the progress stopped at the 90-foot mark ramming the fourth length of pipe and would budge no further, even after 30 minutes of hammering, we suspected the pipe had met an immovable obstacle," Pollock says. "Continued ramming could have damaged the pipe or hammer."

The crew stopped pipe ramming operations to detach the hammer and auger out the spoils in the pipe.

The pipe diameter permitted the crew to physically enter it to inspect the obstacle, and they discovered a 5-foot-wide tree stump perfectly aligned to block their 5-foot-wide pipe.

"You couldn't have hit that tree that precisely if you had been trying to," Pollock says.

Pollock figured the tree must have been felled to make way for the original berm construction, but rather than removing it, it must have been simply covered over. Burial in the wet conditions had preserved the wood remarkably well. The crew cleared the stump away from the pipe path piece by piece using small, electric chain saws. Pipe ramming then continued.

Shortly after they had resumed pipe ramming operations, progress was once again halted. The hammer was removed, the pipe was augered out and the crew crawled inside to see what the new obstacle might be.

"This time it was a wooden pier, the first of many we discovered every 10 to 20 feet from that point on," Pollock says. "The piers were remnants of a bridge or train trestle that predated the berm. Piers were encountered on both of the pipe runs."

Except for these two obstacles and the harsh working conditions, there were no other complications. Undaunted, HURK completed both culverts to their 180-foot length.

LUBRICATION NOT REQUIRED

Pipe ramming on this job was repeatedly interrupted, not only to deal with complications such as cutting away obstacles by hand, but to give the crew time off for rest and to take weekend and holiday breaks. One concern was that the ground would seize the pipe after a period of inactivity. Yet each time HURK resumed operations after a brief period, the pipe moved without any hesitation.

Pollock rigged up the lubrication system lines and had a lubrication mix ready to use on the first pipe, but he never had to inject the mix. "The wet conditions were sufficiently lubricating the pipe," he says. So after the first length was installed, he did not rig up a lubrication system on the others.

After installing the two culverts, the HURK crew back-grouted the failed 48-inch culvert, and restored the working pit and tracks from vehicle and equipment transportation. The project was completed in February 2014.

SAVINGS, PRESENT AND FUTURE

Although the obstacles HURK encountered doubled the time it took to complete the installation project, Pollock says an open-cut installation would still have cost the project owner many times over what the pipe ramming operation entailed. Additionally, open cutting would have required closing this section of the line to rail traffic, adding the expense of rerouting cargo and preventing revenue from this line for an extended period.

Further, railbed restoration after an open-cut operation is vulnerable to settling and consequent subsidence over time, requiring future maintenance and additional cost to repair the berm and railbed at a later date.

In contrast, Pollock says, using the pipe ramming method permitted rail service to continue unimpeded throughout the entire four-month project. The ground conditions of the berm and the integrity of the overlying roadbed were never disturbed. They are not subject to further settling. \checkmark



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Taking More Precautions

ADDED SAFETY NEEDED FOR HYDROEXCAVATING IN OILFIELDS BECAUSE OF VOLATILE FLUIDS BEING USED

BY DOUG DAY

s much as it increases the margin of safety, hydroexcavation can be dangerous work due to the use of high-pressure water and air, and the fundamental dangers of excavation work. For those hydroexcavation contractors who also do work in the oil and gas industry, the presence of petroleum serves to compound those risks, according to Gary Toothe, the training manager for Federal Signal's Environmental Products Group.

His workshop for hydroexcavating in oilfields lasts an entire day and starts with the basics. "We're not trying to create liquid soup," he stresses. "The high-pressure water is used to assist in the removal of the dirt.

If the vacuum can remove the dirt on its own, you don't need any water."

Even if you are well versed in hydroexcavation, working in the oil and gas business requires specialized knowledge and training.

The presence of gas and oil on a hydroexcavation site brings with it explosive risks not normally encountered in the field, which requires flame-resistant clothing as a start. Due to the risk of explosion, all potential sources of static electricity must be eliminated on the work site. "Your truck has to be spick and span, and you have to do assured grounding," says Toothe. "No competent contractor is going to allow you on an active well site unless you can preventing the person from becoming grounded. "Regardless of the voltage you touch, it will not hurt you if you are standing on the mat."

It also protects against injury from step potential: voltage that can be present in the ground around electrical equipment.

Other safety measures are needed to protect against dangerous fumes that petroleum products can produce. "You can blow a lot of contaminants out your blower, so atmospheric monitoring prior to and during the hydroexcavation becomes very important," says Toothe. "You should have a pretty good

"IF YOU TOUCH AN UNDERGROUND ELECTRIC POWER LINE AND YOU'RE NOT ON AN EQUIPOTENTIAL MAT, YOU'RE TAKING YOUR LIFE IN YOUR HANDS." Gary Toothe

idea of what's there by working with your customer. Hydroexcavators are used to clean hydraulic fracturing tanks and to clean underneath drill rigs. There could be materials in there that have both a bad flammability component and vapor component, especially on a sour well, such as hydrogen sulfide, which is both flammable and toxic."

He recommends an OSHA-certified "competent person" on every hydro-

prove that there's not going to be any electrical potential buildup on your equipment."

PETROLEUM ADDS RISK

The static charges are possible due to the friction of water, air and the vacuumed material flowing against the hoses, lances and tanks. "It is enhanced by the presence of petroleum, which is notorious for sucking moisture out of the air," says Toothe. "If there's a hydrocarbon component, you have the potential to create static electricity." OSHA and well owners require assured grounding for all equipment in such work areas.

The risk of static discharge around petroleum products has been known since the 1950s. Three large oil tankers were damaged or destroyed in



separate incidents in December 1969 involving static discharges during waterjetting, resulting in four deaths.

Oilfield or not, special precautions in the form of equipotential mats are required if there are underground power lines in the area to prevent workers from electrocution hazards. "If you touch an underground electric power line and you're not on an equipotential mat, you're taking your life in your hands," says Toothe. The mat clips onto the truck, which prevents electrocution by excavation job as a best practice. "That person can pass on everything OSHA has learned over the past 40 years and keep people safe. If you're going to put people in a hole more than 4 feet deep, you are required to have a competent person on site."

Hydroexcavation for the oil and gas industry requires added training, but it can be worth the added effort, according to Toothe. "It's a very lucrative field. If you do your homework, you can make a lot of money." \checkmark

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The Uncertain Future of Section 179

GENEROUS TEMPORARY TAX DEDUCTIONS HELP SMALL BUSINESSES OFFSET THE COST OF NEW EQUIPMENT

BY ERIK GUNN

ill Congress renew higher limits under Section 179 of the U.S. tax code for 2015? It's a question that has dogged small-business owners annually as they contemplate using generous temporary deductions expanded to stimulate the economy during recessionary times.

Section 179 is a great deal, and most contractors know it. The rule lets small-business owners take an immediate federal tax deduction on the full

purchase price of certain new equipment the year it is purchased. Before its implementation, business owners were required to take the deduction piecemeal over several years, factoring in its depreciating value in the process.

The section has been around a long time, and no one's talking about terminating it. That's not the issue. What no one knows for sure is whether the value for the deduction will stay as high as it's been in

the recent past. And if past patterns offer any clue, we won't know until the year is almost out. That doesn't offer much reassurance to contractors looking into big-ticket items like a new vacuum truck.

EXPANDING THE BENEFITS

Section 179 has traditionally capped the cost of the equipment eligible for the deduction at \$25,000. Also, for businesses that spent more than \$125,000 on equipment in a year, the cap itself went down. So the measure tended to be targeted at really small businesses.

More than a decade ago, however, Congress passed a temporary provision that boosted the cap. For the last few years, a business could qualify for the immediate deduction on equipment costing up to \$500,000. The temporary

"LAST YEAR, TOO MANY BUSINESSES PUT OFF MAJOR PURCHASES BECAUSE OF THE UNCERTAINTY OF

RECOUPING THEIR COSTS AS SIGNIFICANT TAX DEDUCTIONS. FRANKLY, THIS KEPT THEM FROM BUYING MUCH-NEEDED NEW EQUIPMENT."

Eva Rosenberg

change also boosted the ceiling on total annual equipment purchases that a company could make and still qualify for the full deduction to \$2 million.

Those changes were made as part of an economic stimulus program under President George W. Bush after the recession that followed the 9/11 attacks. But they were always written as temporary adjustments. Since then, the temporary adjustments have continued to be renewed from year to year. That sets up an annual cliffhanger, with Congress deciding at the proverbial 11th hour every year to extend the higher deduction limit and the higher spending ceiling to qualify for the provision. Sure enough, in December 2014, the lawmakers did it once again, approving an extension so the provision is much more generous than it used to be.

When it comes to those annual extensions, "Congress has been quite consistent for the last several years about not passing legislation until after

> the year ends," says Eva Rosenberg, the proprietor of TaxMama.com, a website that fields visitors' tax questions.

In fact, she points out, 2014 lawmakers acted a bit sooner than usual, vot-

ing to extend the provision back on Dec. 16. (In the past, when the extension hasn't been granted until after the new year has begun, lawmakers have simply made it retroactive to the year just concluded.)

Even with the earlier activity, by the time Congress finally acted, "there simply wasn't time to order the heavyduty equipment, have it delivered and set up, and put it into use in 2014," Rosenberg says.

TAX LAW TEA LEAVES

That doesn't mean businesses didn't get the break. But Mathias Weber, tax principal at the California-based accounting firm Haskell & White, says that for those businesses it was a lucky extra. They could not include Section 179 as part of their decision-making process.

So while many businesses have probably benefited from the more generous rule when tax time rolled around, they were flying blind at the time of the purchase itself.

> Last year, businesses that waited until Congress acted before pulling the trigger on buying a piece of equipment "had less than two weeks to make decisions on new purchases," Weber says. Furthermore, he points out, for a business to qualify for the break, the new equipment or technology "must be 'placed in service' in the year you take the deduction."

So what's the forecast for 2015?

Weber takes a cautious approach as he looks ahead: "There are no guarantees that the deduction will be renewed for 2015 or that it will be enacted with enough notice to truly look at software or equipment purchases strategically," he says.

That alone is a good reason to deepen your relationship with the CPA who works with your business. (You do have one, right?)

"The best bet is for business owners and company executives to discuss



their business plans with their certified public accountant on an ongoing basis," he continues. Weber likes to be in on the ground floor as a consultant to his clients so he can advise them on the best tax benefit strategies *before* a purchase, "rather than just recording the transaction after the fact."

A CONFIDENT FORECAST

Rosenberg is perhaps a bit more willing to go out on a limb. She reports that most tax professionals are confident the higher limits will once again be extended.

But even if Rosenberg's right, Congress probably won't act until very late in the year. So, once again, if you are relying on lawmakers to help you decide whether to buy that new service truck or trailer jetter, you're probably out of luck. You'll need to decide *without* knowing if you'll get the higher deduction.

So it's understandable if you hesitate.

'LIVING WITH REALITY'

"It's time to live with reality," Rosenberg says. "Last year, too many businesses put off major purchases because of the uncertainty of recouping their costs as significant tax deductions. Frankly, this kept them from buying muchneeded new equipment."

So, don't wait for Congress. "Get the vital equipment you need to grow your business and serve your customer base," Rosenberg concludes.

But, she says, it might be possible to hedge your bets so that you can help your tax bottom line whether or not the higher limits stay in force: See if a supplier will agree to a lease-purchase arrangement conditioned on the section.

"It will take some rewriting of boilerplate contracts," Rosenberg acknowledges. But here's how it would work: Work out an agreement that lets you lease the equipment but also can be converted right away to a conventional purchase loan in the event Congress renews the higher limits for the 2015 tax year.

A conventional lease-to-own contract comes with a nominal buyout price at the end of the leasing period — the part of the purchase cost that is over and above what is built in to your monthly lease payment. With this deal, Rosenberg says your purchase price at the lease conversion would instead cover most of the product's cost — and ensure you get the tax deduction.

Meanwhile, if the tax pros are wrong, the extension does finally expire and the deduction limit falls back to \$25,000, "the buyer can count on deducting the lease payments," Rosenberg says. "It's a little complicated. But if someone needs to spend \$50,000 or \$150,000 for equipment, you need a certain level of assurance that you'll be able to recoup some of that outlay quickly via tax benefits."

ABOUT THE AUTHOR

Erik Gunn is a magazine writer and editor in Racine, Wisconsin.

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No-DigTec owner John Newell (left) reviews plans with City of Mesquite engineer Christina Hickey and inspector Steven Winn. Newell spotted the opportunity to launch his company in the early years of the industry.

No-DigTec LLC Dallas, Texas

OWNER: John Newell FOUNDED: 2000 EMPLOYEES: 25

SPECIALTIES: Pipe bursting water and sewer lines SERVICE AREA: North Texas and southern Oklahoma WEBSITE: www.pipeburster.com

PROFESSIONAL AFFILIATIONS: Underground Construction Technology Association, National Utility Contractors Association, International Pipe Bursting Association

X



BURSTING INTO THE BUSINESS

CHANCE ENCOUNTER LEADS TEXAS CONTRACTOR TO BREAK INTO AND GROW ALONG WITH THE PIPE BURSTING INDUSTRY

STORY: KEN WYSOCKY PHOTOS: JIMMY ALFORD

In 1999, veteran underground-utility and site-prep contractor John Newell clearly saw his business future lying along a busy roadway in Houston.

"I happened to be driving past a sewer line replacement job and saw a very long piece of pipe on the ground," recalls Newell, the owner of No-DigTec LLC, based in Dallas. "I was so curious about what was going on that I had to pull over and find out. I couldn't figure out what in the world they were doing with such a long piece of pipe.

"I talked to the contractor and he told me about pipe bursting," he continues. "I thought to myself, 'Wow this is the future.' At the time, I was seeing (horizontal) boring rigs everywhere, putting in fiber-optic lines, and I knew that eventually it just wouldn't be economically feasible to do open-cut utility installations because all those dry utility lines would be in the way. That's what prompted me to get into pipe bursting."

The chance encounter turned out well for Newell. Today No-DigTec is the largest pipe bursting contractor in north Texas and one of a handful of firms nationwide that has the expertise and equipment to burst large-diameter pipes (generally defined as 24 inches and larger). Moreover, since Newell founded the company in 2000, No-DigTec has invested about \$3 million in equipment, employs about 25 people and will gross about \$10 million in revenue for 2015.

"Like I tell people, every now and then in life opportunity knocks on the door," the folksy, plain-spoken Newell says. "You have to at least open the door and greet it to see if it's something you want to take advantage of. Lots of opportunities exist if people just stop and look around. It turned into a pretty good little thing for us."

Along with the financial success, Newell has become a recognized expert in the field. His company has worked with HammerHead (a brand owned by Charles Machine Works) to test new trenchless equipment. He also periodically serves on expert panels at trenchless technology trade shows, sits on the board of directors of the Underground Construction Technology Association and lectures seniors in the engineering program once every





As new pipe replaces old, Cruz Sanchez hands Juan Rojo rods used to pull the hydraulic hammerhead.

POWERFUL TECHNOLOGY

Pipe bursting technology was developed in England during the 1980s. In essence, it involves pulling — under extremely high pressure a conical-shaped device called an expander head (also referred to as a bursting head) through the pipe that's being replaced.

A length of pipe — typically sections of high-density polyethylene (HDPE) pipe that are fused together — gets connected to the rear of the expander head. Because the back end of the expander head is larger than the host pipe, it fractures the pipe as it's pulled through, clearing a path for the new HDPE pipe following behind it. With the right equipment and soil conditions, almost any kind of pipe — from clay and cast iron to concrete and malleable steel — can be burst, Newell says.

No-DigTec does both pneumatic and static pipe bursting. The former

semester at the University of Texas at Arlington. Not bad for a guy who 15 years ago didn't know a bursting hammer from an expander head and whose company generated only several hundred thousand dollars in gross revenue in its first year of operation.

"I'm self-taught and knowledgeable about pipe bursting," he says. "And I believe I should share that knowledge with all those young engineers. They can take this technology and refine it — take it to the next level. This is an industry that's just getting started and has a bright future ahead of it."

method is used primarily for replacing gravity-fed pipes and the latter mainly for replacing pressurized pipes. Pneumatic bursting relies on a percussion hammer action to help the expander head break the host pipe. A winch located at ground level maintains constant tension on the bursting head via a thick metal cable. In static pipe bursting, a downhole unit pulls the expander head through the host pipe with series of interconnected rods.

Pipe bursting offers many advantages compared to open-cut installations. First and foremost, the new pipe follows the path of the host pipe, so there's rarely a problem with hitting other kinds of lines. Other advantages include:

- About 85 percent less excavation required (the process still requires some excavation - an insertion pit on one end and a receiving pit on the other, plus pits for service reconnections).
- Significantly faster and more cost-effective installations.
- Minimal chance of damage to landscapes and things such as trees, patios, buildings and so forth.
- The ability to upsize pipes for additional flow capacity, sometimes up to five times larger than the host pipe's diameter.
- No long-term lane/road closures.
- Less carbon dioxide emissions from excavation equipment and hauling materials.

BIG MARKET POTENTIAL

Newell did not do any formal market research when he founded No-DigTec. What he did know, however, was that a lot of water and sewer infrastructure installed between the turn of the century and the post-World War II years is reaching the end of its useful life span. "I just knew it was coming," he explains. "And you can imagine all the stuff — fiber-optic lines and such — that they've put on top of those utility lines since then."

"LIKE I TELL PEOPLE, **EVERY NOW AND** THEN IN LIFE **OPPORTUNITY KNOCKS** ON THE

DOOR. YOU HAVE TO AT LEAST OPEN THE DOOR AND GREET IT TO SEE IF IT'S SOMETHING YOU WANT TO TAKE ADVANTAGE OF." John Newell

Originally, No-DigTec focused on residential and commercial work because it dovetailed well with a plumbing outfit Newell operated at the time. But the company gradually switched over to commercial work - replacing lines at malls, high-rise buildings and industrial complexes, for example — before it settled on the municipal market.



Emergency situation: Hospital needed new sewer line STAT

In fall 2003, No-DigTec tackled an unusually challenging job: replacing 200 feet of a collapsed 6-inch sewer line running underneath the Children's Medical Center of Dallas.

The main challenge was accessibility; the hospital's central outdoor courtyard offered the best access to the collapsed line, but its tight, narrow confines made it impossible to bring in conventional heavy equipment — except by helicopter, which wasn't an option because of the intense noise it would generate. Fortunately, crews were able to hand-carry No-DigTec's lightweight, collapsible and portable equipment into the courtyard.

But the project took on added drama because in one month (Oct. 12, to be exact), craniofacial surgeons at the hospital were scheduled to separate conjoined 2-year-old Egyptian twins Ahmed and Mohamed Ibrahim. The high-profile operation was attracting worldwide attention, and a press conference to update a large media contingent was going to be held in the same courtyard where the work was occurring.

The short timeline required No-DigTec crews to work around the clock for weeks. Crews first removed the courtyard landscaping, then hand-dug two 20-foot-deep pits in heavily compacted soil

because there was no way to bring in excavation equipment. Furthermore, the pits required shoring, which took even more time. And because there was no room for an excavator, workers had to instead build a gantry to hold a 1-ton electric lift that removed soil from the pit as workers dug deeper and deeper.

"It was a very labor-intensive process," says John Newell, the owner of the Dallas-based company. "On a stress scale from one to 10, this job was every bit an eight or a nine. There was nothing easy about it. But we got it done."

No-DiaTec used a static pipe bursting system that was lowered into the pit via the electric lift. The static system was used because it can punch a length of interconnected metal rods through collapsed lines. Then those rods get connected to an expander head on the other end of the project. The rig then uses the rods to pull the expander head — with the new pipe connected to it — back through the space vacated by the fractured host pipe.

The project took three weeks to complete, and workers finished about one week before the 34-hour-long surgery took place, Newell says. Both operations were a complete success.



John Newell

As for marketing, Newell says he did very little except for cold-calling during the company's early years. "Once you explain the technology and show that it involves 85 percent less excavation, can save them a little money and get the job done faster, the work kind of sells itself," he notes. "If you sell your services with confidence and knowledge, they'll give you a chance. I don't call on people anymore — the phone just rings. We've got a good reputation especially for clean, efficient work sites — that has spread by word-of-mouth."

The majority of No-DigTec's work centers on not only replacing damaged

lines, but upsizing them as well. More and more municipalities are converting to 8-inch-diameter pipes as the standard for water and sewer lines instead of 6-inch lines, Newell says.

COMPETITORS EMERGE

As more and more engineers see the advantages of pipe bursting and specify bursting instead of open-cut methods, demand for No-DigTec's services has increased. That, in turn, has drawn more competitors into the market. However, several things help his company maintain a competitive advantage, Newell notes. First of all, many project contracts require that contractors have pipe burst a certain amount of linear feet of line; this makes it tougher for inexperienced companies to break in. Moreover, a typical bursting rig setup can cost north of \$150,000, which erects somewhat of a barrier to market entry. And last, No-DigTec has been in the business long enough to give customers confidence in its ability to do the job, Newell says. Trailers, Belshe Trailers, AmeraTrail and Ranch King Trailers; one International 2-ton utility truck; and six pipeline-inspection push-camera systems made by HammerHead, RIDGID and Vivax-Metrotech.

BRIGHT OUTLOOK

Looking ahead, Newell envisions continued growth driven by aging water,

"Bursting looks easy, but there are lots of tricks of the trade you learn only by experience," he observes. "For instance, there are things you can do to minimize the chances of your hammer stalling during critical bursts,

"IF YOU SELL YOUR SERVICES WITH CONFIDENCE AND KNOWLEDGE, THEY'LL GIVE YOU A CHANCE." John Newell

like under roads and highways. If it does stall, they're not going to close down a highway so you can dig it out, so you'll have to get another line under the highway. So a \$200,000 job could turn into a \$1.5 million liability because you didn't have the experience to set it up right.

"You really have to plan ahead," he adds. "Sometimes, for instance, you have to disrupt traffic because there's no other space to lay out, say, 500 feet of pipe. Again, it looks easy, but there's so much more to it in terms of planning."

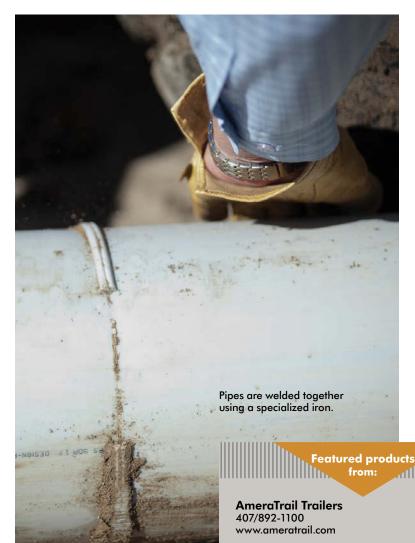
EQUIPMENT DRIVES PRODUCTIVITY

In the past, No-DigTec has burst around 30,000 feet of pipe a year, Newell says. This year, the company could do as much as 50,000 feet. To accomplish that kind of production,

No-DigTec has acquired a large fleet of vehicles and equipment aimed at boosting efficiency and customer satisfaction. The company's machines include five static and six pneumatic pipe bursting rigs made by HammerHead; three HammerHead winches (one 20-ton winch and two 12-ton units); three air compressors made by Sullair (a division of Accudyne Industries) used to power pneumatic hammers; five HammerHead hydraulic power packs that supply power to the static rigs; and three HDPE pipe fusion machines made by McElroy Manufacturing.

In addition, the company owns two tandem-axle dump trucks made by Mack and International (a brand owned by Navistar); eight excavators built by Takeuchi Manufacturing; three backhoes and two skid-steers made by New Holland (a brand owned by CNH Industrial America); six 1-ton flatbed trucks made by Chevrolet, Ford and Dodge; and three pickup trucks made by Dodge and Chevrolet.

The company also relies on a trailer-mounted water jetter made by US Jetting (18 gpm at 4,000 psi) used to cut roots from and clean debris in pipelines; an SPV800 trailer-mounted hydroexcavator built by VACMASTERS (a brand owned by Barone) used for potholing to spot gas and telephone lines or excavating around existing utility lines; 16 assorted trailers made by Interstate



Belshe Industries, Inc. 405/273-1690 www.belshetrailers.com

HammerHead Trenchless Equipment 800/331-6653 www.hammerheadtrenchless.com (See ad page 3)

Interstate Trailers 800/433-5384 www.interstatetrailers.com

McElroy Manufacturing, Inc. 918/836-8611 www.mcelroy.com/fusion

New Holland Construction 630/260-4000 www.newhollandconstruction.com

Ranch King Trailers 979/865-5467 www.ranchkingtexas.com sewer and gas infrastructure and increasing acceptance of pipe bursting as an alternative to open-cut pipeline replacements. How much infrastructure needs replacing just in the metropolitan Dallas area alone? "If I gave a number, it would be just a guess," Newell says. "But it's a bunch. Let's just say I'm not worried about job security."

On a microlevel, Newell hopes to one day tie a local record for the largediameter burst: a 2,234-linear-foot pull of a 42-inch pipe. "I would at least like do that much or more so I can get some bragging rights," he says.

But until then, Newell says his company will continue to thrive as long as it follows his simple business model: Do professional, quality work; stand behind the work that you do; and charge a fair price. "As long as you do those things, customers will keep coming back," he says. "It's worked for me." ▼

> RIDGID 800/769-7743 www.ridgid.com

Sullair 219/879-5451 www.sullair.com

Takeuchi Mfg. 706/693-3600 www.takeuchi-us.com

US Jetting, LLC 800/538-8464 www.usjetting.com

VACMASTERS 800/466-7825 www.vacmasters.com

Vivax-Metrotech Corp. 800/446-3392 www.vivax-metrotech.com

Horizontal Directional Drills DIRECTORY

TIONZONIUL DIRECTORY		DIRECTORY			Fuel Tank Size		Entry Angle	
	MANUFACTURER	MODEL NAME	Engine Make & Model	Gross Engine hp	(gallons)	(lbs.)	(degrees)	
See ad page 19	Akkerman Contact: Akkerman Sales 58256 266th St. Brownsdale, MN 55918 tf: (800) 533-0386 www.akkerman.com akk@akkerman.com	GBM 240A Jacking Frame	John Deere 4-cylinder diesel	99 (74 kW)		5,300 w/base	30-45	
The Laught Litt Providing Solutions Since 1921	McLaughlin Group Inc. Contact: Jeff Wage, Vice President 2006 Perimeter Road Greenville, SC 29605 p: (864) 277-5870 tf: (800) 435-9661 f: (864) 235-9661 www.mclaughlinunderground.com mmole@mightymole.com	McL-10H Pit Launch Directional Drill	Remote hydraulic powered	n/a	n/a	1,100	pit launched	
	Pow-R Mole Sales LLC Contact: Brian Kelly 1400 Commerce Parkway Lancaster, NY 14086 tf: (800) 344-6653 www.powrmole.com brian@powrmole.com	PD-6	Honda GX630	20	6.5	750	pit launch	
TORO. Count on it.	The Toro Co. Contact: Josh Beddow 8111 Lyndale Ave. S Bloomington, MN 55420 p: (800) 344-8676 f: (952) 887-7223 www.toro.com/underground dingo@toro.com	Toro DD2024	Cummins B 3.3 Turbo	74	30	10,980	16	
		Toro DD4045	Cummins QSB 4.5 Turbo	160	67	21,620	16	

Boring Equipment DIRECTORY

				Fuel Tank Size	Model Weight		
	MANUFACTURER	MODEL NAME	Engine Make & Model	Gross Engine hp	(gallons)	(lbs.)	
MGLAUGHLIM Providing Solutione Since 1921	McLaughlin Group Inc. Contact: Jeff Wage, Vice President 2006 Perimeter Road	McL-24B Auger Machine	Deutz diesel, air-cooled	31		2,900	
	Greenville, SC 29605 p: (864) 277-5870 tf: (800) 435-9661	McL-54/60 Diesel Auger Machine	Deutz 6-cylinder diesel turbo	174 at 2,300 rpm	15	7,560 carriage weight	
	f: (864) 235-9661 www.mclaughlinunderground.com mmole@mightymole.com	CBM48 Cradle Boring Machine	Deutz 6-cylinder diesel	174 at 2,300 rpm	44	17,000	

Pull Back (lbs.)	Thrust (lbs.)	Max. Spindle Torque (ft/lb)	Max. Spindle Speed (rpm)	Drill Pipe Diameter (inches)	Max. Drilling Depth (feet)	Min. Bore Diameter (inches)	Rod Carrying Capacity (feet)	Other
50 ton	100 ton	10,500	50	4.1	n/a	4.1		Configurations for 4-48" pipe installations available, for a variety of soil conditions, pipe diameters & applications
13,250	17,670	1,030	100-125	1.88	pit depth	2	180	Optional: mud/water pump pressure 700 psi, model length 5' or 7', hydraulic powerpack 30 hp
79,000	84,000	4,500	2	2	15	1/2 - 8		The PD-6 directional thrust boring system is a dry bore pit launch machine
20,000	20,000	2,400	200	2.06		4	400	Standard on-board drilling fluid pump with flow up to 30 gpm, quad rack and pinion carriage design, integrated full-color LCD display, option for single or dual joystick operation, and heavy-duty open top vise wrenches
40,000	40,000	4,500	225	2,375		4	520	Standard on-board drilling fluid pump with flow up to 70 gpm, quad rack and pinion carriage design, cab option, integrated full-color LCD display, option for single or dual joystick operation, and heavy- duty open top vise wrenches

Transmission	Clutch	Thrust	Boring Range (inches)	Auger Torque (ft/lb)	Centerline (inches)
3 forward speeds, reverse	OPC hydraulic	115,000 lbs @ 3,000 psi	4 - 24 cased bore	8,512 9,100 max.	16.87
5 forward speeds, reverse	OPC hydraulic	950,000	16 - 60 cased bore	148,700	32.5
5 forward speeds, reverse	OPC hydraulic	201,000	16 - 48 cased bore	170,000	32.5

BY CRAIG MANDLI

Product Focus:

Directional drilling, boring, bursting and tunneling can be used to install and repair utility systems often without disturbing the surface, saving resources and time. Here are several tools used in those processes, including drilling equipment, mixing systems, mud pumps, pipe

bursting tools and fusion equipment.

Drilling Equipment

Akkerman tunneling equipment Pipe jacking



equipment from Akkerman helps accurately install a variety of underground infrastructure. The company partners with contractors to explore project solutions for a wide range of geology, pipe diameters of 4 inches through 14 feet and numerous lengths.

507/567-2261; www.akkerman.com

American Augers **DD-110** The DD-110

110,000-pound HDD boring machine from American Augers comes with a 260 hp Cum-

mins Tier 4 Final engine, providing power for 15,000 ft-lbs of rotary torque and 110,000 pounds of thrust/ pullback. A full range of horizontal directional drills and auger boring machines are available.

800/324-4930; www.americanaugers.com

Armadrillco Arma Drillo

Arma Drillo transmitter housings and drillheads from Armadrillco are vibration-proof, protecting electronics from excessive shock and heat. They are easy to assemble and disassemble on command. Lock pins cannot be over-torqued or bro-

ken. Three styles of bits will fit and work on the drillheads, including bullet-tooth, flat-blade or roller-cone bits. The bullet-tooth bit has adjustable teeth, and



teeth supported on heads instead of necks. They have stainless steel key components, and numerous bit designs are available.

800/994-0915; www.armadrillco.com

Ditch Witch JT9

The JT9 horizontal directional drill from Ditch Witch uses a high-performance, air-cooled, 64 hp Tier 4 Deutz diesel engine to offer 9,000 pounds of pullback force. Its sturdy yet compact frame combines the simplicity and easy operation of smaller drills with the advanced features of



bigger drilling machines, such as a heavy-duty anchor system and integrated remote display. 800/654-6481; www.ditchwitch.com

Foremost Dual Rotary Drill

Dual Rotary Drills from Foremost have two rotary drives, including a lower rotary drive used to advance steel casing through sand, gravel, glacial till and boulders. The lower drive feeds and rotates the casing independently of the top drive. The casing is held securely in the lower drive by a set of power-operated jaws. Once the desired cas-

ing depth is reached, the drill continues drilling open-hole like a con-



ventional top drive drill. There is no need to trip out or change tools when transitioning to openhole drilling. The independent rotary top drive simultaneously handles a drill string, which can be equipped with a down-the-hole hammer, tri-cone or drag bit. Cuttings are typically evacuated with air, but drills can also be configured with pumps for mud or flooded reverse circulation drilling. 403/295-5800; www.foremost.ca

Herrenknecht HDD **Downhole Tools**

With the Full Face Hole Opener from Herrenknecht, pilot holes can be enlarged in a single step. The tool is modular in design. Thanks to replaceable disc cutters, it can be used in various ground conditions and quickly refurbished or modified. It

is complemented by the company's Down Hole Jet Pump, which is installed directly behind the full face hole opener and



cleans the borehole and removes the cuttings directly inside the drill string. As a result, the simplest drilling fluid can be used even with larger cuttings. Its only function remains the support and sealing of the borehole. The combination enables exactly round, clean boreholes created in one single step, conserving bentonite.

www.herrenknecht.com

Little Beaver auger blades and points

Replaceable blades and points from Little Beaver mount on the

company's regular and heavy-duty snap-on augers

with ease. They protect the augers from wear while drilling in soils that range from loamy soil to compacted rock. They fasten to the auger with two steel bolts, and operators can remove the bolts with a common adjustable wrench. They are made with cold-rolled steel and hard surfacing to their edges. With these blades and points, the augers can drill more than 100 holes in prime soil conditions before servicing is needed. Smaller-diameter augers - 1 1/2-, 2- and 3-inch – use standard points that screw or pin on. For dense soils, carbide blades fasten to the bottom of the snap-on augers, similar to the standard auger points, and cut hard clay and frozen ground into smaller pieces. 800/227-7515; www.littlebeaver.com

Pow-r Mole Sales directional-thrust borina machine

The PD-6 directional-thrust boring machine integrated with the P1-6RT rod turner from Pow-r Mole Sales is a trenchless pit launch boring system. The PD-6 was designed to install pipe and cables in difficult soil conditions. This system can steer accurately, making it ideal for the installation of gravity sewer pipes on grade. It can oper-

ate from a pit 6 feet long by 3 feet wide, and has a thrust force of 84,822 pounds at 3,000 psi. The maximum push rate is 8 feet per minute, and it can install up to 8-inch ID pipe



in most compressible soils. The P1-6RT rod turner creates 4,500 ft-lbs of torque, allowing the operator to steer the rod string up to 200 feet. The PD-6 thrusting mechanism slides on a chrome-plated steel guide bar, eliminating wear from occurring to the high-strength steel machine frame. 800/344-6653; www.powrmole.com

Railhead Underground Products EXTReam Reamer

EXTReam Reamers from Railhead Underground Products are available in five sizes from 6to 16-inch diameter, with connections for virtually every drill. Field-replaceable teeth allow the user to stay on the job, saving downtime. It comes with a complete set of jets and plugs so the reamer can

be configured to the varying ground conditions encountered throughout a project. The 6-, 8- and 10-inch units are built with an API pin and box with a removable pulling eye at



the back of the reamer. This allows the user to quickly hook up many configurations, including pulling reamers in tandem, or using the reamer as a stabilizer for subsequent passes.

888/313-7455; www.railhead.com

Reed Manufacturing Reed's Feed Tap Machine

The Reed's Feed Tap Machine from Reed Man-

ufacturing drills through PVC, PE, cast iron and ductile iron pipe while under pressure using a corporation stop inserted into a service saddle. The compact design, with a separate, independent feed control for advancing the heavy-duty shell cutter into the pipe, allows the user to easily complete the tap using an electric or cordless drill, right angle

drill for cast and ductile iron, or a 7/16-inch wrench with manual power for plastics. The independent feed control advances the shell cutter for tapping PVC pipe as recommended by Uni-Bell PVC Pipe Association. The FT2000UNIV kit contains both a coupon-retaining drill bit and two sets of coupon-retaining magnets ideal for ductile iron taps. FTP2000UNIV comes with all adapters, shell cutters, shell cutter adapters and a ratchet wrench with socket to cover 3/4- to 2-inch services in PVC and PE, and a sturdy carrying case. **800/666-3691; www.reedmfgco.com**

RODDIE Basement Buddy

The Basement Buddy from RODDIE was designed for the installation of underground service lines from home basements to the city meter pit or curb stop. The system slides apart into two

pieces weighing less than 100 pounds each, and is easily transported into the basement or an outside excavated pit. Working as a directional drill, navigating up, down, left



and right, the new service line can be installed without disturbing existing landscaping, sidewalk, driveways or buildings. The machine is hydraulic powered and uses 2- or 3-foot drill stems with a steering capability of 1 degree per foot. It offers a push/pull force of 6,000 pounds. Applications include waterlines, sewer lines, gas lines, electrical conduit and irrigation pipes.

888/406-3821; www.roddieunderground.com

Mixing Systems

Mud Technology International MCT 450 Mud Man

The MCT 450 Mud Man from Mud Technology International is ideal for drill fluid mixing and

cleaning. It comes with a 2,400-gallon two-section tank with approximately 450 gpm cleaning capacity, a high G-force linear



shaker, 5-inch cone desilter bank, a high-shear/ low-pressure mixing hopper, unitized trailer with Pintle hitch, high-shear submersed turbo jet guns, tool-free clean-outs, a 480-volt three-phase generator, safety shutdowns, centrifugals for mixing, desander valve connection for supercharge, and night work lights.

866/675-3240; www.mud-tech.com

Mud Pumps

Dragon Products mobile water- 4 transfer pump



Mobile water-transfer pumps from Dragon Products have Redi-Prime vacuum-assisted priming, with a run-dry mechanical seal, powered by a John Deere 6090 Tier III 325 hp engine with 160-gallon-capacity integral fuel tanks. They have a maximum flow of 4,900 gpm with a 368-foot total dynamic head. The units have DOT lights and tandem torsion-ride axles, stabilizer jacks and electric brakes.

866/914-8198; www.dragonproductsltd.com

Hydra-Tech Pumps S4CSL

The S4CSL submersible 4-inch hydraulic-driven sand slurry pump from Hydra-Tech Pumps includes a built-in agitator used for stirring up solids. It has hardened alloy wear parts and is designed to be used in applications where settled solids must be put into suspension and pumped away with the discharge water. Primary appli-



cations include desilting ponds, lakes and streams; other uses include filling sand bags to prevent beach erosion, tank and digester cleaning, or pumping sediment from caissons. It requires hydraulic inputs of up to 17 gpm at 2,800 psi, and when combined with HT20 to HT35 open and sound-attenuated power units, is capable of output flows to 750 gpm. **570/645-3779; www.hydra-tech.com**

Gorman-Rupp self-priming trash pump

Solids-handling selfpriming trash pumps from Gorman-Rupp Company are used for drilling rig



cellar pumpout, transferring drilling mud slurries, frac tank and reserve pit water transfer, tank loading and closed-loop recirculation. Designed and engineered to exacting standards, models are available to meet all fluid-handling needs.

419/755-1011; www.grpumps.com

Pipe/Pipe Tools

Advanced Drainage Systems SaniTite HP

SaniTite HP from Advanced Drainage Systems provides a solution for sewer casings or rehabilitates deteriorated CMP and RCP culverts. The lightweight pipe and triple-wall design reduces friction and allows for longer uninterrupted pushing distance with light construction



equipment. Liner systems are highly resistant to abrasion and are not susceptible to chemical attack or corrosion. It has ideal watertight joint performance meeting the requirements of ASTM D3212. Sizes available include 12- to 60-inch diameter with lengths of 20 feet. Custom pipe lengths are available. **800/821-6710; www.ads-pipe.com**

Diamond Plastics Corp. Diamond Lok-21

Diamond Lok-21 restrained joint PVC pressure pipe from Diamond Plastics Corp. is manufactured in accordance with AWWA C900 in sizes from



4 through 12 inches, as well as 16 and 24 inch to DR14 and DR18 with a pressure rating of 305 psi and 235 psi, respectively. It is also manufactured to ASTM D2241 in 3-, 4-, 6- and 8-inch sizes to DR21 and DR26 with pressure ratings of 200 psi and 160 psi, respectively. To install, clean the lubricant, align and insert. No splines, special tools, machines, nuts, bolts or wrenches are needed. Components push together similar to standard gasketed PVC pipe, as the restraint mechanism is built into the bell. This decreases installation time while reducing complexity.

308/384-4400; www.dpcpipe.com

IPEX USA TerraBrute CR

Engineered for horizontal directional drilling and other trenchless applications, TerraBrute CR from IPEX USA is a nonmetallic, AWWA C900 PVC pressure pipe system. Noncorroding and installation friendly, it enables the standardization of PVC throughout a potable water and sewer infrastructure. Its nonmetallic ring-and-pin gasketed joint design provides additional pull strength up to 120,000 pounds for 12-inch pipe. Rounded

bell shoulders slide by roots, rocks and other debris that can protrude into the borehole. It requires no relaxation time before installation of fittings or services. It



is made from stock certified to CSA B137.3, and is Factory Mutual, ULC and ULI approved. **800/463-9572; www.ipexamerica.com**

ScreenCo Systems Handle-Tech Hose Handles

Handle-Tech Hose Handles, distributed by ScreenCo Systems, enable technicians to safely clamp onto hose or pipe and easily grip, torque and Product Focus: B



and efficiently manipulate hoses and pipes in any climate. They are ideal for drilling, mud suction hose, tanker hose, pneumatic truck hose, aircraft refueling hose, frac pipe, drill pipe, welding poly pipe and other rigid pipes. Sizes range from 1 1/2 to 6 inches, with an 8-inch version coming soon. Handles are manufactured with long-glass nylon that enhances the thermal insulation properties. They are strong, nonconductive and wear resistant in temperatures from -40 to 150 degrees F to withstand steam blasting with deicing equipment. **208/790-8770:**

www.screencosystems.com

Pipe Bursting Equipment

Anaconda Trenchless Systems pipe bursting system

The pipe bursting system from Anaconda Trenchless Systems can be used for trenchless replacement of existing utility, water, gas and

sewer piping that is either worn out, undersized or incapable of meeting the

needs of growing communities. An existing pipe is replaced size-for-size or upsized with a new pipe in the same location and accomplished by pulling the new pipe through the old pipe. The demolition cone, by virtue of its size or its radial expansion ability shatters the old pipe and forces the fragments into the surrounding soil. The technique is cost-effective, as there are few lateral connections when the old pipe is structurally deteriorated and when additional capacity is needed. The process can be used on pipes of cast or ductile iron, clay, steel, concrete, ABS or PVC.

562/365-3627; www.anacondatrenchless.com

Spartan Tool UnderTaker

The UnderTaker pipe bursting system from Spartan Tool helps replace existing sewer laterals with new, seamless, highflow HDPE pipe from 2 to 6 inches in diameter. It sets up quickly, without any tools, and handles up to three 45-degree bends in the existing pipe. No



component weighs over 70 pounds, so it's easy to position for any job. All this is done with minimal disruption to the customer's yard or business, allowing the customer full use of facilities fast.

800/435-3866; www.spartantool.com

TRIC Tools X30

The small, lightweight X30 pipe bursting unit from TRIC Tools is ideally used to replace 4- and 6-inch sewer laterals. It is designed for home sewer bursting of 1- to 6-inch lines, and weighs less than 85 pounds. Cylinders can cycle quickly with matching highpressure hydraulic power packs, resulting in fast job com-

pletion. Complete downhole assem-

bly consists of puller, pulley base and resistance plate. The compact unit has a monolithic, gundrilled hard aluminum cylinder body for simplicity and easy maintenance, and a steel pulling bridge for extra reliability and longevity.

888/883-8742; www.trictools.com

TT Technologies Grundoburst

The Grundoburst static pipe bursting system

from TT Technologies can pull in a variety of replacement pipe, including PVC, DIP, ABS, cast iron, fusion



welded HDPE and VCP jacking pipe. It uses a bladed cutter head to make bursting ductile iron and steel pipe possible. Pulled by a hydraulic bursting unit, the cutter head's cutting wheels split the host pipe. An attached expander spreads and displaces the split pipe into the surrounding soil while simultaneously pulling in the new pipe. Quick-Lock bursting rods are linked together, not threaded, saving time, preventing twisting and extending the life of the cutter head. Six models are available for bursting 2- through 54-inch pipes.

800/533-2078; www.tttechnologies.com

Pipe Fusion Equipment

McElroy Manufacturing Talon 2000

The Talon 2000 pipe fusion machine from McElroy can be used to fuse large-diameter thermoplastic pipe from 54 inches in diameter. It can lift pipe from the ground with powerful jaws as the

machine adjusts its height and orientation to correctly align and fuse pipe. It is a self-propelled vehicle, eliminating the need for cranes. It straddles the pipeline as a wire-

the pipeline as a wireless remote control operator moves it from fusion to fusion. It is self-contained and powered by an Ultra-Low Sulfur Diesel (ULSD) engine that provides electric and hydraulic power.

918/836-8611; www.mcelroy.com/fusion 🕶

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COLE, Inc is now accepting proposals for sessions to be presented at the 2016 WWETT show in Indianapolis February 17-20, 2016. If you are interested in presenting please send us a completed session proposal form **no later than August 1, 2015**. Forms may be completed online at wwettshow.com/CFP.

Accepted submissions will receive four (4) full registration passes to the 2016 WWETT Show. **Presentations should be 60 minutes** *in length and cover topics from a neutral, "non-product-specific point of view."*

For a list of accepted topics and to submit your presentation proposal please visit:

wwettshow.com/cfp





Playing in the Mud

RECYCLING SYSTEMS CUT BACK ON WASTE PRODUCTS, SAVE ON TRANSPORTATION COSTS

BY CORY DELLENBACH

ater for drilling operations can be tough to come by, and disposal costs for mud used in drilling can be expensive for companies to haul away.

For contractors trying to control their costs on job sites, reducing the costs of trucking in water and hauling away thousands of pounds of waste has a big impact in the long run.

Mud recyclers are one way to reduce waste and cut expenses, and they can be used with drilling operations of all sizes. These machines pull in dirty mud — slurry — used in directional drilling, and separate the solids from the liq-

uids in order for the liquids to be used several times over.

THE RIGHT UNIT

Finding the mud recycling system that works best for your company can be tricky, but there are certain things you can look for to make your decision easier, according to Mud Technology International.

Factors that contractors should consider when looking for a mud recycling system include:

- Type of drill being used
- Drill rate
- Type of solids
- Length of the bore
- Gpm of the pump
- Tank volume you will need
- Number of cones
- Screen size

Contractors should be concerned about the environment as well when selecting a mud recycling system. The right unit will protect the environment and leave the job site as clean as possible.

"The industry is very stringent on keeping clean job sites," says Seth Matthesen, senior product manager for Ditch Witch. "They're really concerned about having it kept clean."

ADVANTAGE OF MOBILE

There are several mud recyclers on the market from Mud Technology, KEMTRON Technologies and several others. Most of the systems are too large to move without the use of semis, but there are several on the market that are mobile and can be moved with pickup trucks.

"Without these systems, you're going to take that mud from the drilling process and haul it off to your disposal area, which may be 5 to 100 miles down the road," says Matthesen.

The MR90 from Ditch Witch is unique in that it is the only unit available



A contractor works on the Ditch Witch MR90 mud recycler at a job site. The unit is new for the company and was released to the market in November 2014.

Typically with a mud recycling system, the amount of waste hauled off a work site is considerably lower. Matthesen recalls a customer in Chicago who was pumping 20,000 to 40,000 gallons of fluid a day, and he only had to haul off 1,000 gallons thanks to the recycling system that was used.

that can be towed full of fluids. Matthesen says other units on the market don't have trailers that are certified to haul that much material, so water must still be hauled to the system and then away following the job.

Ditch Witch says its MR90 can be set up on a job site within 10 to 15 minutes.

"In the mid-sized market, which our unit fits best, it's fair to say that those drills are probably only going to be on and off a job in less than two to three days," Matthesen says. "So to go through the process of taking a unit out and spending an hour to two hours to set it up just costs you money."

THE MR90

The MR90 — Ditch Witch's first mud recycling system — operates with a 25 hp Kubota Tier 4 engine that provides the power for recycling, drilling and all hydraulic functions, including the shaker action.

The unit sports a 450-gallon mud tank — a 110-gallon clean tank and 340-gallon first-pass mud tank. It also carries a 300-gallon freshwater tank for extra drilling fluid capacity and can be used for equipment cleanup.

Slurry — dirty mud — is first delivered to the MR90's first-pass shaker screen where it is shaken to separate mud returns from larger particles. Those

MUD RECYCLERS ARE **ONE WAY TO REDUCE WASTE AND CUT EXPENSES,** AND THEY CAN BE USED WITH DRILLING OPERATIONS OF ALL SIZES.

returns are collected in the rear hopper and later disposed of, or returned to the ground after being mixed with a drying agent.

Mud is then pulled from the 340-gallon first-pass mud tank where it is filtered again through six 2 1/2-inch hydrocyclones and final shaker screen. The clean mud is then stored in the 110-gallon clean tank for future use in drilling operations.

The unit has a shut-off on the tank, so when the tank gets full it will automatically shut off to prevent spills. It also allows for the operator to move away from the unit if needed.

"We got into this industry because we make our own drill pipes that go onto our own drills, our own electronics and our own beacons," Matthesen says. "We can design and manufacture the units here, and we have quality control. We know it's going to work well with our units."

KEEPING THEM RUNNING

With any mud recycling system, it's important for contractors to pay attention to the screens and hydrocyclones on the units, according to John Miller with Mud Technology.

Miller says routine maintenance on the machines will extend the life of the complete mud system and the unit's individual components.

"When it is time to move the equipment from one location to another, take a few minutes and thoroughly wash the machine to remove all mud and debris," Miller says.

Miller says it's hard to determine the general life span of a mud system when purchased new. Ground composition and the volume of use play big roles in how long the system will operate effectively.

"What I normally tell contractors is we have units that were built in 1996 that are still in use today and still going strong," Miller says. "We also have had units that had a life of less than five years of hard service that have required refurbishing and upgrading." ▼

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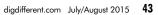
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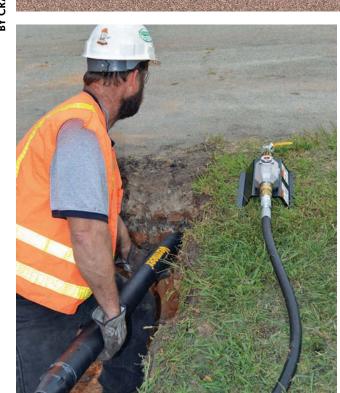
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Tunneling BY CRAIG MANDLI



Piercing tools provide less disruptive alternative to trenching

PROBLEM

United Cable Construction, based in Ladson, South Carolina, was contracted to complete a 2-mile fiber installation project to bring additional cable and Internet service options to Mooresville, North Carolina. The project plan called for CIC feeder cable, approximately 1/2 inch in diameter, encased by a 1 1/4-inch outer conduit. Installation was specified on the street side so disruption, footprint and maintaining the integrity of the existing landscape were primary concerns.

SOLUTION

Since the site was an established residential area and infrastructure was crowded because several utilities had already been installed, the project manager used **Vermeer by McLaughlin Hole Hammer** piercing tools and a stitch boring installation approach. Stitch boring calls for a series of shorter shots — less than 50 feet in length — and allows crews to locate existing utilities while self-excavating the launch pits. This process is both accurate and costefficient, which helps enhance overall installation productivity.



The Hole Hammer was used to complete each bore. Then mule tape was installed and conduit pulled from bore pit to bore pit and "stitched" into place. In each conduit run, the fiber was installed and connected. The crew used tarps for temporary storage of spoil, cut sod for surface reinstatement and restored each pit the same day to minimize disruptions to residents. The contractor used a four-person crew to help keep labor costs in line, while achieving 400-plus

feet of production, including excavation, installation and restoration, per day. 800/435-9340; www.mclaughlinunderground.com.



Island beachfront blemish-free after trenchless storm sewer upgrade

PROBLEM

A Biscayne Bay, Florida, storm sewer upgrade required three 100-foot, 12-on-12 storm sewer runs of HDPE. Buildings stood in close proximity to the outfall pipes. The Miami Office of Capital Improvements and Transportation Program limited bidding to pipe bursting replacement. One sewer to be replaced was vitrified clay pipe; two were concrete. The varying tidal cycles and a pulling machine pit immersed in salt water rated the IPBA Class A project as an experimental technique performed under Class D conditions.

SOLUTION

Contractor Maggolc Inc. used a **HammerHead Trenchless Equipment Hydroburst HB100** 100-ton pulling machine with 15-inch OD expanding head. Maggolc left one lane open around its coned-off curbside pulling pit. Residential traffic flow was not otherwise interrupted. The end of the storm sewers lay 3 feet below the sea's surface, requiring no entrance pit. The low tide schedule limited the crew to six hours or less for a pull, one pull to a shift. HDPE in lengths of 100 feet had been fused onshore. Ends plugged, they were floated from shore to a preparation barge. An excavator aboard the barge lifted the HDPE in place for crews to connect the pipe to the expander head.

Actual pipe bursting time per run was less than 30 minutes to pay out pipe and 20 minutes for pull back. Bursting runs required only 15 tons of the HB100 pulling machine's full 100-ton capability. Restoration consisted of repair to the seawall where it had been chipped away to accommodate expansion and backfilling the working pit. **800/331-6653; www.hammerheadtrenchless.com.**



Challenging conditions no match for sewer pipe system

PROBLEM

The growing seaside community of White Rock, British Columbia, Canada, is clustered on a steep hill around a 5-mile sandy beach in Semiahmoo Bay. Over time, the sanitary and storm sewer systems grew with a mix of materials, including PVC, asbestos cement and concrete. The entire system needed replacing.

SOLUTION

Consulting engineers decided that the **PVC SDR 35** gasketed sewer pipe and fittings system from **Royal Building Products** was the best choice. It is lightweight, durable and easy to install. "It gave us a lot of flexibility because two PVC pipes could be laid side-by-side. Twin trenching allowed installation to be done very quickly and efficiently," says David Chan, branch manager with Alpin & Martin Consultants. "This could not have been achieved as effectively with a thicker-walled pipe such as concrete. Thinner walls meant narrower trenches, less disruption to the community and fewer road cuts."



Given the underground surprises, PVC made design changes easier. "We were able to install several more lineal feet in a day compared to other types of products," Chan says. "Flexibility is critical when dealing with less-than-ideal ground conditions and an older infrastructure with different materials. You need to come up with answers quickly. The ability to move things around when needed made it easier to work in and around utilities in a safe manner." Crews

installed more than 1,100 miles of storm and sanitary sewer pipe, 34 manholes and 130 service connections without any significant problems. **800/232-5690;** www.royalbuildingproducts.com.



Multiple progressive reams ensure smooth installation

PROBLEM

To meet the demands of a growing residential area, the City of Ottawa, Ontario, Canada, set out to install a 5-mile water feeder system, consisting of a 42-inch-diameter HDPE pipe. A 2,000-foot section of the bore presented a particular challenge. City planners were concerned with one of the two water crossings, which traversed a creek feeding the Ottawa River, the city's primary water supply. The sticky clay conditions and the size of the installed utility presented a serious frac-out threat. The bore plan had to focus on methods and tooling to eliminate the possibility of drilling fluid intrusion into the waterway.

SOLUTION

Stopping the reactive clay from swelling by maximizing cuttings flow, the bore plan called for an initial pilot hole and 16-inch pre-ream, followed by a series of progressive reams. The design team at **StraightLine HDD** was tapped to supply the reamer solutions. The aggressive open-bodied **Reverse Radial Flow** reamer was specified, in 24-, 36-, 48- and 54-inch diameters. The bidirectional design is suited for push/pull reaming, and provides ample open space and fluid delivery to deal with significant cuttings volume. For stabilization of the hole, the cutting reamers were followed by 22- and 34-inch Maxi Barrel ream-

ers. Finally, a 54-inch Reverse Radial Flow, followed by a 46-inch Maxi Barrel was selected to handle pipe installation.

Over a five-week period, the progressive reaming process — executed by pulling/pushing the StraightLine reamers — resulted in an ideal final utility installation. 800/654-3484; www.straightlinehdd.com. ▼

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THE LATEST: News

Compressor Products names vice president

Compressor Products International named Chris LoPriore vice president of global commercial development. He will lead CPI's global sales staff.

General Pump names sales representative

General Pump promoted Nick Viestenz to outside sales representative. He has been with General Pump for 12 years, working in research and development, cus-



Nick Viestenz

tomer service and inside sales.

Pacific Marine Power adds Volvo line

Pacific Marine Power provides Volvo Penta diesel and gasoline marine engines, generator sets and controls to customers in Washington, Oregon, Idaho and Alaska.

Aries Industries named Business of the Year

Aries Industries was named a 2015 Top 10 Business of the Year by the Waukesha County Business Alliance and BizTimes Media. The award recognizes companies headquartered in southeastern Wisconsin that have consistent financial growth and demonstrate good business practices through employee relations, customerfocused commitment, community service and business education partnerships.

Quadex rebrands, launches division

Quadex launched a rebranding campaign with the expansion of its products and services, and introduced Quadex Lining Systems for pipe rehabilitation. The new division will license its turnkey pipe rehabilitation system featuring GeoKrete geopolymer to qualified contractors.

ASTM sponsors student intern

ASTM will sponsor Derek Burling, an electrical engineering student at the University of Wisconsin-Madison, for the 2015 Washington Internships for Students of Engineering (WISE) program.

Amthor International partners with Alkane Truck

Amthor International partnered with Alkane Truck Co. of Myrtle Beach, South Carolina, to offer an alternative energy cabover chassis. Amthor manufactures truck-mounted tanks serving the refined fuel, propane, mining, vacuum and septic, portable restroom, water, well drilling and construction industries. Alkane specializes in medium-duty trucks, medium-heavy trucks and heavy-duty tractors that run on liquid propane autogas, compressed natural gas or liquid natural gas.

Legacy Equipment expands facility

Legacy Equipment completed a 16,000-square-foot addition at its Salt Lake City facility. The addition



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includes six service bays and 6,000-square-foot warehouse and paint booth.

PIP expands sales team

PIP named Dan Lessard regional sales manager in central Canada, John Harrison regional sales manager for western Canada, and Mario Miron regional sales and marketing manager for Quebec and the Atlantic regions. PIP also named Jerry Gascon ATG country manager for Canada and Kurt Reichart territory account manager for Canada.

Wastequip adds regional sales managers

Wastequip named Anthony E. Parker and Ernie Castro regional sales managers for its Technical Products Division. Parker will be responsible for the Midwest region and Castro will be responsible for growing sales in the Southeast, Latin America and Caribbean.

Wabash National names managers

Wabash National's Aviation and Truck Equipment business, which manages the Progress Tank and TST brands of truck-mounted tanks, named Michael Warkentien vice president and general manager, aviation and truck equipment. Wabash also named Nancy Rudolph engineering manager; Wayne Terpstra director of sales, Progress and TST; Matt Decker sales manager, Progress and TST; Steve Thorn sales manager, Progress Tank; and Dan Pederson sales associate, Progress Tank and TST.

Vacuum Truck Rental adds Hydro-Knife hydroexcavator

Vacuum Truck Rental added the Ledwell Hydro-Knife hydroexcavator to its fleet of rental equipment. The 2,100-gallon hydroexcavator delivers up to 200 degrees of hot water at 3,000 psi. Two 125-foot hoses work independently or in tandem to deliver 10 gpm each. The Hydro-Knife supports multiple excavators with or without onboard water systems.



GapVax website enables users to build their own truck

The Build-A-Truck feature from GapVax enables website visitors (www.gapvax.com) to design their own equipment by choosing the options that best meet their needs. Selecting municipality or contractor, users can design an MC Series combination jet/vac or HV Series wet/dry vacuum truck. Hydroexcavator options include debris and water tank sizes, debris tank material, duct work and cyclone material, interior debris tank coating, liquid load indicator, cold weather package, off-load, sound, boom and lighting options. Other options include toolbox, chassis, gauges and electronics. When finished, users can submit their design and receive a formal proposal for their truck.

AMERISAFE names senior vice president

AMERISAFE, provider of high hazard workers' compensation insurance, named David Morton senior vice president of sales and marketing. He will be responsible for future sales and growth within the organization.

Benlee offers recycling report

Benlee Inc., manufacturer of rolloff trailers, and its sister companies, Goldsboro and Raleigh Metal Recycling, launched the Commodities and Metal Recycling Report. The weekly video, posted on the companies' websites, features a synopsis on the industry, as well as demand and pricing direction for metals and other commodities. ▼

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COLE Seeking Presenters for 2016 WWETT Show

COLE Inc. is now accepting proposals for seminars to be presented at the 2016 WWETT Show in Indianapolis, Indiana, Feb. 17-20.



Education is a huge part of the Water & Wastewater Equipment, Treatment & Transport Show. The 2015 WWETT Show offered more than 100 educational semi-

nars covering everything from nozzle selection to manhole rehabilitation.

Industry professionals interested in presenting in 2016 should complete and submit a seminar proposal form no later than Aug. 1, 2015. Forms may be completed online at wwettshow.com/cfp.

Accepted submissions will receive four full registration passes to the 2016 WWETT Show. Presentations should be 60 minutes in length and cover topics from a neutral, non-product-specific point of view.

Presentations should focus on one of the following topics:

- Septic collection, treatment, and disposal
- Grease collection, treatment, and disposal
- Municipal collection, treatment, and disposal
- Onsite systems installation, components, and maintenance
- Sewer & drain cleaning, inspection, repair, relining, locating, and detection
- Dewatering, biosolids, treatment, and technology
- Portable sanitation special events and restroom service
- Business marketing, financials, and social media
- Safety
- Trucks & service vehicles DOT regs, service, and maintenance
- Technology and software
- Excavation methods $\mathbf{
 abla}$



"There are different ways to excavate soil. Most people think you're just

spraying water on the ground, but it's a science — there's a right way to do it.



and that makes me want to work even harder.

The guys and I all have something to prove."

Mike Morehouse, Owner Davids Hydro Vac White Bear Lake, Minn.



Read what matters to contractors in every issue of Dig Different.

Products



1. TT Technologies plastic pipe splitting heads

Plastic pipe splitting heads from TT Technologies are capable of splitting and replacing plastic gas service and mainlines from 1/2 inch to 4 inches in diameter. The hardened heat-treated steel cutting blades are available in various designs and sizes to match the type of plastic host pipe and soil conditions.

800/533-2078; www.tttechnologies.com

2. CUES portable mini-mainline push camera

The MPlus+ XL portable mini-mainline push camera from CUES features swappable camera heads, pan-and-tilt camera with 360-degree rotation, video observation coding, asset management software interface and digital recording. The 65-pound system includes large, durable wheels for portability and stability. **800/327-7791; www.cuesinc.com**

3. Marengo smart remote tank monitoring

Tank-Intel smart remote tank monitoring from Marengo Fabricated Steel is a hardware/software based system that works on any tank. Duallevel sensors deliver two liquid tank levels to a smartphone, PC or tablet. Changes in the chemical and physical properties of the measured substance do not affect the sensor. The customizable system can withstand temperature extremes.

800/919-2652; www.mfsltd.com

4. Cooper Roadmaster drop-deck trailer tire

The RM272 Roadmaster tire from Cooper Tire is engineered to withstand the demands of drop-deck trailers. The tire features four-belt steel casing, 16/32-inch thread depth and is available in size 255/70R22.5, load range H. **800/537-9523; www.coopertire.com**

5. Kohler mobile diesel generators

Model 145REOZT4 and 175REOZT4 mobile diesel generators from Kohler Power Systems are EPA-emission certified for non-road use and feature a DOT-certified enclosed trailer. Both units have John Deere Tier 4 Final 6.8 liter engines. The 145REOZT4 is capable of a 130 kW standby rating while the 175REOZT4 is capable of a 154 kW standby rating. Both models have 24-hour runtime fuel tanks, external emergency stop, stainless steel door latches and hinges, 110 percent environmental containment, single-point lifting eye and cold-weather package. **800/544-2444; www.kohlerpower.com**

6. Mr. Manhole 52-inch manhole cutter

The B-52 manhole cutter from Mr. Manhole has a 52-inch fixed cutting diameter with optional 40- and 60-inch-diameter cutters. Carbide cutting teeth, which can be replaced in seconds, bite through asphalt and concrete road surfaces, removing manhole frames and surrounding road surfaces in minutes. The tool is designed for small municipalities or contractors who perform fewer than 50 manhole frame adjustments a year. **419/741-9075; www.mrmanhole.com**

7. Cat Pumps high-pressure plunger pump

The Model 3550 high-pressure plunger pump from Cat Pumps is rated to 10 gpm at 6,000 psi. The pump is designed for equipment operating in high-duty cycle applications in remote or mobile applications such as hydroexcavating, jetting, blasting and hydrostatic testing. It can be directdriven hydraulically or pulley driven from a motor or engine. Features include completely lubricated and cooled V-packings and low-pressure seals with hard-chrome plated forged brass inlet/discharge block manifolds. The wet end can be serviced without entering the crankcase. **763/780-5440; www.catpumps.com**

8. NLB high-pressure waterjet pump unit

The Model 355 high-pressure waterjet pump unit from NLB Corp. has a 350 hp diesel engine that can be towed to job sites. Rated for a maximum operating pressure of 20,000 psi, it can be converted to operate at 8,000, 10,000 and 15,000 psi. Flows range from 26 gpm to 63 gpm. The pump is available in an UltraGreen configuration for compliance with the latest Tier 4F emission requirements.

248/624-5555; www.nlbcorp.com

9. Vactor hydroexcavator blower option

The Robuschi blower option is available on the HXX HydroExcavator from Vactor Manufacturing. The blower is rated for 6,176 cfm and 28 inches Hg. The hydroexcavator also has a 3,000 psi variable water multiflow pump with DigRight technology that allows the operator to select a maximum water pressure limit. **800/627-3171; www.vactor.com**

10. Coxreels T Series stainless steel reels

Spring-driven stainless steel T Series hose reels from Coxreels feature an extra-large chassis with dual pedestal-style design and Super Hub that provides triple-axle support to reduce vibration and strengthen the structural integrity of the reel. The reels are made from electro-polished stainless steel with stainless steel fluid paths, offering noncorrosive performance in required applications.

800/269-7335; www.coxreels.com

11. LMT Smart-Dig hydroexcavator

The HX-4000 hydroexcavator from LMT Inc., in partnership with Smart-Dig of New Zealand, has a modular sub-frame that mounts to a 33,000 GVWR new or used single-axle truck. Features include an auxiliary 83 hp Kubota diesel engine, 1,500 cfm Tuthill 6015 blower, 3,000 psi (7 gpm) Udor waterblaster, 4.7-cubic-meter (6 cubic yards) debris tank and four side-mounted, rotary-molded water tanks totaling 1.5 cubic meters (396 gallons). The wireless, remote-control telescoping boom rotates 270 degrees. Options include a 400,000 Btu AquaBlast, fuel-oil-fired water heater for cold weather operation.

800/545-1074; www.vaxteel.com *(continued)*



This Issue's Feature:

Hydraulic excavator's larger undercarriage increases over-the-side lift capacity

BY ED WODALSKI

The **PC390LC-11** hydraulic excavator from **Komatsu America** has the same upper structure and improvements introduced with the PC360LC-11, but with a larger undercarriage and greater drawbar pull. The roller frames on the PC390LC-11 have a 6 percent wider track, 8 percent longer track on the ground and larger final drives for 13.5 percent greater draw pull, providing up to 18 percent greater over-the-side lift capacity than the PC360LC-11.

"Where the 390 really shines is with the larger undercarriage," says Kurt Moncini, product manager, Komatsu America. "With varying ground conditions or inability to get really close to the edge of the trench, that greater over-the-side lift allows the 390 to sit a little farther back and still lay pipe."

Powered by a Komatsu SAA6D114E-6 EPA Tier 4 Final engine that delivers 257 hp, the excavator has an operating weight of between 87,388 and 89,248 pounds. Both the PC390LC-11 and PC360LC-11 hydraulic systems feature an enhanced power mode for greater productivity and lower cost per ton. The ROPS and OPG level 1 certified cab has a heated airsuspension high-back seat, two 12-volt power ports and optional joysticks with proportional controls for attachment operation. The joysticks also have a standard pattern change valve.

"Being able to easily change the control pattern makes it a lot easier if you have operators used to different machines," Moncini says. "Within 10 to 15 seconds the operator can change back and forth between ISO and Backhoe patterns."

KOMTRAX technology relays fuel levels, diesel exhaust fluid (DEF) levels, operating hours, idle time, machine location, cautions and maintenance alerts to a smartphone or Web application. The operator identification system (OIS) reports

key information for multiple operators while the auto idle shutdown function

helps reduce idle time as well as operating costs. The OIS can segment machine data by individual operator, shift or application.

The Komatsu diesel particulate filter (KDPF) and selective catalytic reduction (SCR) system reduce particulate matter and NOx while providing automatic regeneration that does not interfere with daily operation. The 10.3-gallon DEF tank is located in a lockable compartment directly behind the right-side toolbox and is sized to provide a 2-1 diesel to DEF refill ratio.

Incorporated in the 7-inch LCD color monitor is a landscape view from the standard rear camera along with pertinent gauges and information.

"Each time you start the machine, your default camera view is on the left and normal gauge display on the right," Moncini says. "With a lot of people around the machine, pipe liners really like the greater situational awareness because an operator can see what's behind him and the vehicle information at the same time."

847/437-5800; www.komatsuamerica.com

THE LATEST: Products



12. Total Piping Solutions universal service saddle

The Triple Tap T3 stainless steel universal service saddle from Total Piping Solutions is designed for all types of pipe, including ductile iron, cast iron, PVC, asbestos cement, steel and HDPE. All versions feature an insulating boot to prevent contact with the pipe, reducing the potential for corrosion when used on ferrous pipe materials. The service saddle is rated to 250 psi maximum working pressure and uses NSF-61 approved NBR rubber. Branch connections are available in 1/2- to 2-inch diameters. Outlets come in CC or NPT threaded pitches. The saddle exceeds all industry safety standards, including AWWA C800. **716/372-0160; www.tps.us**

13. Doosan Portable Power air compressor

The P185 T4F air compressor from Doosan Portable Power features a

Tier 4 Final compliant Doosan D24 engine with low-maintenance diesel oxidation catalyst (DOC) after-treatment system. Operating at 74 dBA, the air compressor delivers 100 psi at 185 cfm and 10 hours of runtime at 100 percent load with 500-hour service intervals. Applications include powering hand tools, sandblasting, sprinkler and irrigation line blowout, cable laying and pipeline testing.

800/633-5206; www.doosanportablepower.com

14. Vanair gas rotary screw air compressor

The Viper gas rotary screw air compressor from Vanair Manufacturing delivers 60 to 80 cfm at 100 to 150 psi and features an EFI certified Kohler engine. The 42-inch-long by 21-inch-wide by 30-inch-tall compressor fits behind the cab or can be mounted on the side-pack. **800/526-8817; www.vanair.com**

15. Weatherford composite frac plug

The TruFrac composite frac plug from Weatherford International is rated for use in environments with temperatures to 300 degrees F and pressures to 10,000 psi. It can be used in single- and multiple-zone stimulation operations in vertical, deviated, horizontal or multilateral wells. When deployed in horizontal wells, the plug can run in hole up to 500 fpm. **713/693-4161; www.weatherford.com**

16. O'Brien trailer jetter with sediment pump

The 7000 Series of trailer-mounted jetters from O'Brien Mfg., a product of Hi-Vac Corporation, feature water tanks with a sediment pump for easier cleaning and longer life, as well as 15 percent more water capacity. The trailer also features the muffler and air cleaner mounted inside the enclosure for improved sight line, electric reel control for smoother rotation and ease of control, and hydraulic and water gauges mounted in the main control panel for easier viewing. **800/752-2400; www.hi-vac.com**

17. Trelleborg immersed tunnel seals

Gina and Omega gaskets from Trelleborg Pipe Seals Milford are designed to prevent water ingress in immersed tunnels. The Gina gasket is made from natural rubber combined from varying hardness and is supplied as a closed rectangular frame to seal each sectional element. The Omega seal connects each segment and is made from multiple layers of styrene butadiene rubber and nylon inlayers for durability. The seals enable the transfer of hydrostatic loads and movements between tunnel ends caused by soil settlement, concrete creep, temperature and earthquakes. **800/626-2180; www.trelleborg.com/en**

18. Water Cannon hot-water pressure washer

The Honda hot-water pressure washer (product ID 18H26) from Water Cannon has a Honda GX 390 engine and choice of a General or Cat ceramic plunger pump. Features include a portable four-wheeled push bar frame for support, 4 gpm, 4,200 psi, and 118-degree temperature rise and overheat safety valve.

800/333-9274; www.watercannon.com

19. Martin Engineering impact cradle

Heavy-duty, medium-duty and light-duty impact cradles from Martin Engineering feature a bed of steel angles lined by energy-absorbing impact bars with a top layer of low-friction, ultra-high molecular weight (UHMW) plastic for longer-lasting conveyor belts and components. The cradles are designed to be located at transfer points of receiving conveyors, under the hopper and chute box, close to the tail pulley. The cradles have wing supports that adjust to match CEMA standard trough angles, as well as a 5 percent fine-tuning adjustment angle.

800/544-2947; www.martin-eng.com ▼

MARKETPLACE ADVERTISING

Happenings

CALENDAR

Sept. 14-17

Short Course on Tunneling, Colorado School of Mines, Golden, Colorado, www.csmspace.com/events/tunneling/.

Sept. 21-23

Fourth Annual Cutting Edge Conference, Urban Tunneling, Grand Hyatt, Denver, www.ucaofsmecuttingedge.com.

Sept. 29-Oct. 1

International Construction & Utility Equipment Exposition (ICUEE), Kentucky Exposition Center, Louisville, Kentucky, www.icuee.com.

Nov. 2-4

WJTA-IMCA Conference & Expo, Ernest N. Morial Convention Center, New Orleans, www.wjta.org.

Nov. 9-11

International Associations of Directional Drilling (IADD) Annual Technology Forum Series, Hyatt Regency Lost Pines Resort and Spa, Austin, Texas, www.iadd-intl.org.

Feb. 3-5, 2016

Underground Construction Technology (UCT), Georgia World Congress Center, Atlanta, www.uctonline.com.

March 20-24, 2016

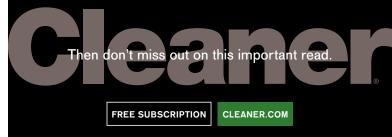
NASTT's No-Dig Show, Gaylord Texan Convention Center, Dallas; www.nodigshow.com.

April 22-28, 2016

World Tunnel Congress (WTC), The Moscone Center, San Francisco, www.wtc2016.us.

Dig Different welcomes your contributions to our Happenings column. To recognize members of your team, please send notices of new hires, promotions, service milestones, certifications or achievements. We also invite your national, state or local associations to post notices, news items and learning opportunities. Send contributions to editor@digdifferent.com.

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