"If you go to Canada and say you need a hole dug, the first thing they'll think is that they need to get a hydroexcavator."

Joe Schotthoefer

Doestch Industrial Services technicians Jason Hale and Dave Black use a hydroexcavator to cut a trench eight feet deep and uncover utilities that cross over a gas main planned for relocation.

EXCAVATING EDUCATOR

Joe Schotthoefer of Doetsch Industrial Services helps customers learn the advantages and techniques of digging with water

By Doug Day

There is potential danger every time a contractor starts digging. Underground electric lines, fiber optic cables, natural gas lines — the hazards are real, and sometimes deadly. Doetsch Industrial Services of Warren, Mich., avoids these hazards with hydroexcavation, and also helps bring customers up to speed on the techniques.

"If you go to Canada and say you need a hole dug, the first thing they'll think is that they need to get a hydroexcavator," say Operations Manager Joe Schotthoefer. That's not so in the United States, even though hydroexcavation dates back more than 100 years.

Miners used steam-powered pumps and pressurized water to erode hillsides to get to the minerals they were collecting. The advent of the vacuum truck started modern hydroexcavation in the mid to late 1960s.

Joe says customers, from other industry professionals to customers who buy services, have to be educated about hydroexcavation and how it can help them. "It's not just going out there saying, 'We're a 100-year-old company — let us come and do this,'" says Joe. "It takes workshops and meetings and education. It's a long process of making people aware that this technology exists and how it can be used."

Doetsch Industrial conducts seminars at conventions for groups like the American Public Works Association and goes into engineering firms for brown-bag lunch forums.

One of the company's web sites at www.safeshovel.com helps people see and understand hydroexcavation, the many ways it can be used, and the margin of safety it provides. One set of pictures shows a 250-foot trench that had three known utility crossings. Workers safely uncovered 14 others while excavating.

Not expensive

Hydroexcavation is part of a wide range of services Doetsch offers. Others include professional cleaning of wet and dry materials above or below ground for municipalities, manufacturing facilities, power plants, foundries, chemical plants, and refineries. The company is certified under the ISO 9000 international quality standard — the only Michigan industrial cleaning contractor to hold that designation.

An uninitiated customer may think hydroexcavation is an expensive alternative, but Joe tells them, and shows them, that it's cost effective in the context of the entire job. The Safe Shovel web site has illustrations. For instance, opening a hole to expose utilities takes about

A technician cuts a shallow trench excavation for an electrical conduit run in 15 degree weather.

PROFILE

DOETSCH INDUSTRIAL SERVICES, WARREN, MICH.

OWNERS:	Doetsch family
YEARS IN BUSINESS:	106
EMPLOYEES:	42
FLEET:	Vacuum loaders, combination sewer cleaners, liquid haulers, high-pressure water blasting equipment
SPECIALTIES:	Hydroexcavation, pipeline inspection, vacuuming, liquid hauling (hazardous and non-hazardous), water blasting, and others
WEB SITE:	www.doetschindustrial.com

At the left, hydroexcavation created a 1,200-foot-long trench for an electrical conduit run for a Michigan utility company. Above, location of direct burial electrical wire using a 15 degree fan tip nozzle at 10 gpm.

106 Years of Service

The Doetsch business name has been around since 1898 when the great-grandfather of the current generation started a business that cleaned sewers with a shovel and buckets. "When you put your family name on the line every day for 100 years, there's no other way to do a job than the right way," says Frank Doetsch, CEO of Doetsch Industrial Services.

Today, 87-year old Frank is the senior member in the business. He is advised by the fourth generation and keeps a watchful eye on the fifth generation.

Doetsch Industrial introduced an electric sewer machine in the late 1920s. It consisted of a bucket hooked on a cable and anchored in the manhole. In the 1970s, Doetsch brought hydraulic sewer cleaning to Michigan. The company found many other applications for jetting and vacuum technology and so expanded its service to industries.

With a fifth generation in the Doetsch family coming up the line, one can only imagine what the next 100 years will be like.

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Joe Schotthoefer

7.5 hours with traditional excavation and requires 26.6 cubic yards of earth for backfill and restoration. With hydroexcavation, the same job takes 2.5 hours and 3 cubic yards.

Hydroexcavation and traditional excavation can be used together for such things as mapping out a construction site. Called Subsurface Utility Engineering, the technique is used to verify the location and depth of underground facilities and make an accurate map before excavation and construction begin. Precise measurements are possible with very little digging and with minimal disruption.

Customers also need to know what to look for in a hydroexcavation contractor. Joe says specialized equipment and training are important. Conventional sewer machines with high water flow but very low pressure don't work. "They're not doing a whole lot except making a big mess," he says.

Hydroexcavation requires just the opposite: low water flow and higher pressure — three to six gallons per minute at 3,000 psi. The soil and water slurry are conveyed via an 8-inch vacuum tube at eight to 10,000 cfm at 12 to 15 inches of vacuum to a 12 cubic yard truck-mounted debris tank.

If the unit is not used exclusively as a hydroexcavator, then chances are the truck has vacuumed other materials such as sanitary waste, greases, oils, manufacturing by-products or, worst of all, hazardous material. If the excavated material is re-used, the result could be a contaminated site.

Hydroexcavation vacuum tubes and water guns must be properly designed for safety. Both should be rubber or plastic to prevent tearing through utility lines, puncturing pipes or creating sparks.

Doetsch Industrial has one Vactor HXX hydroexcavation unit in its fleet and two more on order from its supplier, Jack Doheny Supplies of Northville, Michigan.

Creative mind

Joe says a creative mind can find many uses for hydroexcavation, since the technique makes it easy to work in areas that would be impossible with mechanical equipment. "We can work in places where you wouldn't even have enough room for a shovel, like a crawl space," he says. "We can easily work in buildings and courtyards — places where mechanical equipment is too bulky."

His company was called upon to save a homeowner who discovered a broken sewer pipe under a new addition. The only access to the broken line was through a crawl space under the house. The plumber was going to have people with five-gallon buckets haul the mess out of the house. Ironically, that's the way Doetsch would have done the work when it started in the business back in 1898.

Instead, Doetsch Industrial used hydroexcavation. Using the old method, "They would have tracked mud from one end of the house to the other, not to mention how long it would take," says Joe. "We were in there for a day and vacuumed out the material. Everything was loaded on the truck. At the end of the day, we drove away. You would have never known any construction took place."

Doetsch Industrial has done hydroexcavation work in residential and industrial settings and "all sorts of strange things in

Doetsch personnel dig earthen footings for a concrete generator pad for a Detroit-area construction company.

"If you went in with a backhoe, you're going to take a much larger piece than what you're after, because it's all frozen together. If that frozen ground is wrapped around utilities, they are coming out with it."

Joe Schotthoefer

between," says Joe. One customer was re-bricking two adjacent buildings to make them look like a single structure. "We excavated six feet straight down, and the concrete mixer followed right behind us to pour the footings for the new brick," says Joe. The job was finished in a day.

If the customer had used conventional excavation, it would have taken a lot more work: removing a sidewalk, excavating and storing the soil in the street, installing forms, pouring the concrete, pulling the forms, backfilling, and putting in a new sidewalk.

Digging for footings

Last winter, Doetsch worked for a local telephone company that was installing backup generators at its sites. "We were able to excavate the footings so there was no need for concrete forms," says Joe. "It was precise to the size and very neat, so we could pour concrete right into it, and that was it. We definitely saved them a few steps."

Cold weather is hardly a challenge, since hydroexcavation can use water heated to 130 degrees or more. A utility company probably wishes it had known that while trying to repair a damaged water main in winter. The utility had used Doetsch's services before, but the people on the job assumed hydroexcavation wouldn't work with the heavy frost.

When they finally called on Doetsch for help, the company not only finished the repairs quickly, but spent a couple of days fixing damage done by the initial efforts to cut through the frozen soil with jackhammers.

The advantages of hydroexcavation are magnified in such conditions. "If you went in with a backhoe, you're going to take a much larger piece than what you're after, because it's all frozen together," says Joe. "If that frozen ground is wrapped around utilities, they are coming out with it."

Joe says hydroexcavation is perfect for septic systems, especially on lots with mature trees and foliage that could suffer extensive or fatal damage from traditional digging. "We can do all the excavation and leave all the roots and just cover them back up when we're done," he says. That can mean a lot to a customer who has spent years and a small fortune on landscaping.

Trenching exposes facilities in preparation for an updated electrical service to a set of control valves.

A crew can quickly go in to make a septic system repair, backfill, and leave before the homeowner gets home. "You can bring less equipment with you. It's much quicker because you're only removing the amount of material that's necessary," Joe says. "You don't have to spend the additional time restoring it."

Staying safe

Doetsch Industrial's safety ratings are better than industry averages thanks to a universal approach — the company takes it seriously, and so do employees. All operators are certified before going on the job, and all employees receive safety training specific to their jobs and the work locations. The company's safety supervisor visits all job sites to ensure adherence to work rules and safe work practices.

Employees are trained in Hazmat, fall arrest safety, back safety, confined space entry, ventilation and atmospheric testing, confined space non-entry rescue, MSDS sheets, lock-out/tag-out, personal protective equipment (foot protection, safety harness fit and use), and respiratory protection. In addition to the training, Doetsch Industrial Services has vehicles equipped and dedicated to confined space entry. Most work crews are also equipped with their own air monitor for their own safety.

Hydroexcavators perform a mass excavation of a pipe repair pit.

Hydroexcavation increases that safety margin by preventing accidents caused by hitting underground utilities. It also keeps workers out of holes and trenches and away from the risks inherent in them. For Joe, it all comes down to one thing: going home safely at the end of the day. ■