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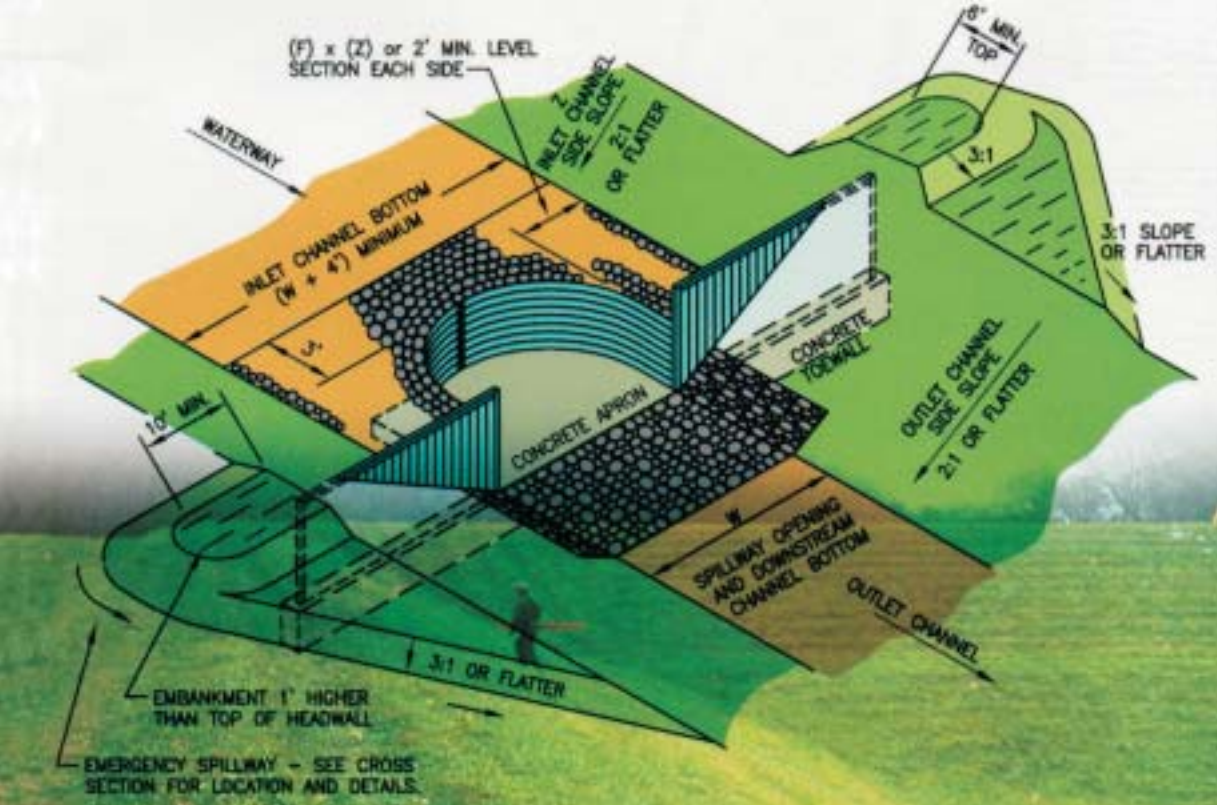

Baton Rouge Uses HDD to Install Sanitary Sewer Line

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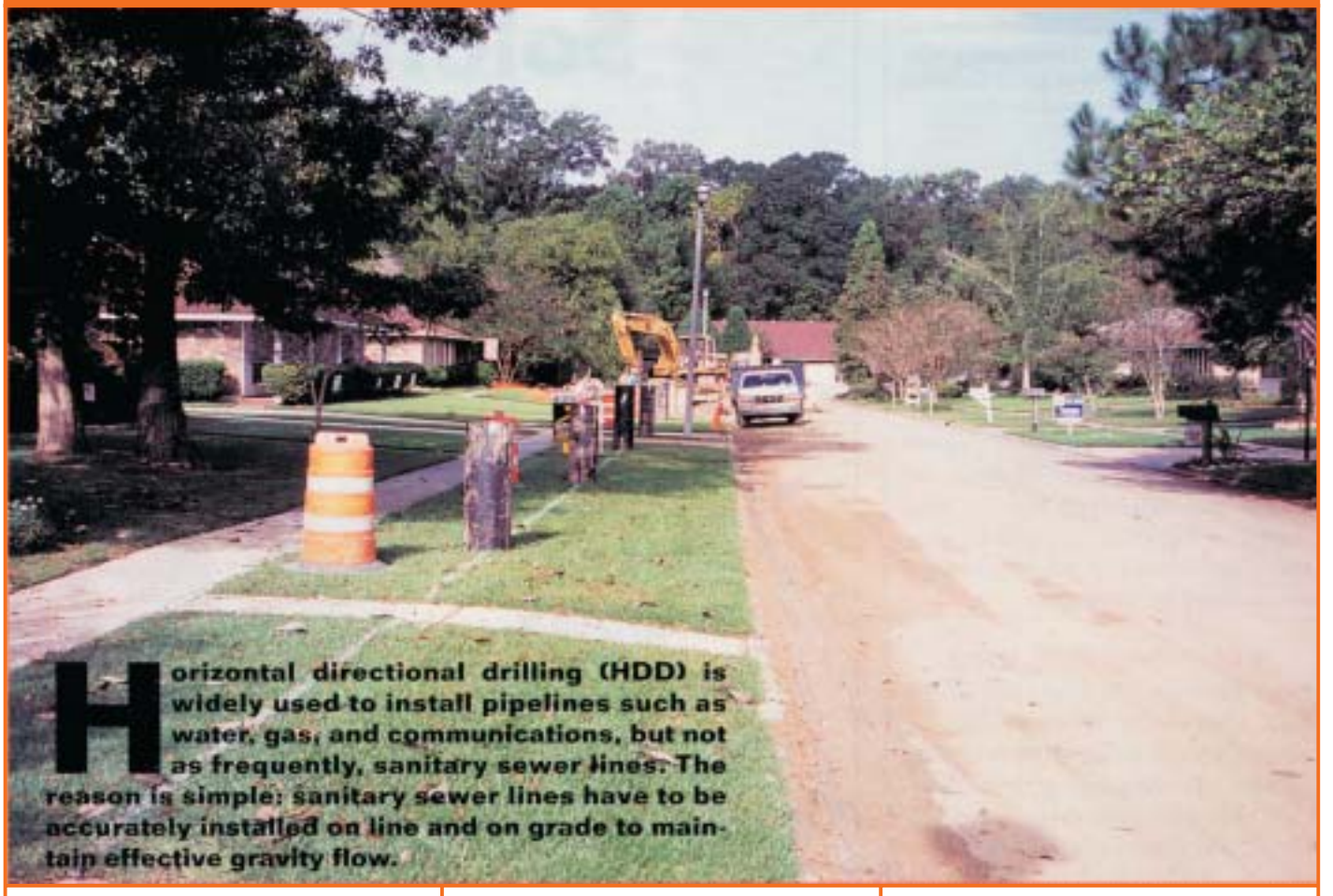
BATON ROUGE USES HHD TO

Install Sanitary Sewer Line



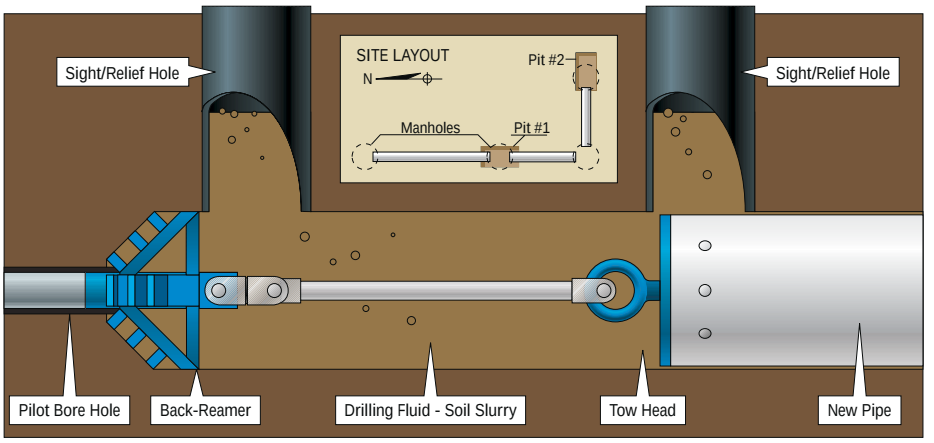
Horizontal directional drilling (HDD) is widely used to install pipelines such as water, gas, and communications, but not as frequently, sanitary sewer lines. The reason is simple: sanitary sewer lines have to be accurately installed on line and on grade to maintain effective gravity flow.

heoretically, it has always been possible for HDD contractors to install pipelines on line and on grade, but the odds were greatly against them. If they attempted to use standard HDD methods, they could never know if they were within specifications until the installation was complete. For contractors, that's too late. A very small failure rate can put many operators out of business. They need to know from the beginning of their pilot bore until the final pipeline is in place that they are on line and on grade, and that the pipeline will stay where it is placed.

THE BATON ROUGE CHALLENGE

Recently, when the Baton Rouge, Louisianna, City/Parish Public Works Department needed to install a new, 10-in. diameter sanitary sewer relief pipeline to serve a rapidly growing area, the Request for Bids did not specify an installation method, but all the submitted bids were for cut-and-cover. "We were the low bidder," said Bill Selig, president of Magnolia Construction Company (www.magconco.com) "but I sure didn't want to dig up that neighborhood to install the pipe."

The 850-foot-long pipeline was to be installed 15 feet deep in an upscale residential neighborhood. A cut-and-cover installation would require cutting across two streets, destroying the sidewalk, many concrete driveways and streetlights, disrupting other



Above: As the new pipeline is pushed or pulled through the bore hole, the drilling fluid-soil slurry can escape into the sight/relief holes. This allows the pipe to be installed into a tight fitting hole without building up excessive pressure and damaging nearby utilities or above-ground structures. Top Right: The new dual-stem technology, developed by DitchWitch, produces a smoother bore hole with less wallowing than single-stem drill rods. Right: One section of the new pipeline was back-reamed from an existing manhole and the new pipe was pushed through the bore hole to this location. Bottom Right: The drill stem is seen as it passes through Pit # 1. Later, the new pipe was installed in both directions from this pit.

utilities and established landscaping, and restricting homeowners' access. It would also create a muddy mess in the middle of winter.

Selig had heard about the patented ArrowBore (www.arrowbore.com) installation process gives contractors and pipeline owners the constant assurances they need, to know they are within specifications. This is done through a series of unique developments and modifications to standard installation techniques. The process was developed by Ted Dimitroff and is owned and licensed worldwide by Advantica Technologies (www.advantica.biz).

The most obvious difference between ArrowBore and a standard HDD installation is the use of sight/relief holes. These are a series of precisely aligned, vertical holes (usually 16-inches in diameter) drilled along the path of the new pipeline. The holes are about two feet deeper than the planned depth of the new pipeline and are usually lined with a polyethylene (PE) pipe.

One use of the sight/relief holes is to allow the location of the pilot stem to be sighted and measured periodically during the boring process. By having a vertical hole directly in the intended path of a bore, the exact coordinates of the drill stem can be physically measured when the stem passes through the hole. If the stem is not within specifications, a correction can be made before the bore continues.

A second purpose for the sight/relief holes is to provide an escape route for the boring fluid and spoilage that is pushed ahead of the incoming pipe, thereby relieving the pressure that is created as the new pipe is pulled or pushed through the bore hole during the back-ream. This relief allows the use of a borehole which is only slightly larger than the outside diameter of the new pipe, thus greatly reducing the amount of drilling fluid necessary, and ensuring that the new pipeline will not float around in the bore and settle out of specification. "I checked into microtunneling, but it was too expensive," says Selig. "That's when I heard about ArrowBore.

Selig said, "Ted Dimitroff had already talked to the city and they were willing to try the process with the understanding that it had to meet the same line and grade specifications as cut-and-cover. I talked to Ted and he agreed to come to Baton Rouge and supervise the installation using the ArrowBore process."

PLANNING FOR SUCCESS

Actually, a team of companies worked together to ensure the success of the installation. Frank Canon, global accounts manager of Baroid Industrial Drilling Products (www.baroididp.com) says his company gave their full support to the project by testing the soil and supporting the type of fluid mixture that was used. "In this case, we used a combination of products to achieve a very flowable mixture of spoilage with very little boring fluid," he said.

Jerry Montgomery, president of J. Montgomery Sales in Baton Rouge (e-mail: jmontgo@aol.com) explained that he recommended a very rigid PVC pipe manufactured by CertainTeed Corporation (www.certainteed.com).

... the integrity of the bore hole can be maintained because the drill stem does not whip about and wallow it out.

The Certa-Lok™ C900 Restrained Joint piping system is relatively thin-walled, yet strong enough to be pushed or pulled through the bore hole. The pipe's stiffness prevents sagging or bowing after the pipe is in place.

Steve Jester, president of Ditch Witch of South Louisiana (e-mail: sljester@bellsouth.net) says Ditch Witch (www.ditchwitch.com) has developed a dual-stem drill rod that is especially helpful in drilling tight bores on line and on grade. The inner stem of this rod turns, but the outer stem does not. As a result, the integrity of the bore hole can be maintained because the drill stem does not whip about and wallow it out.

THE INSTALLATION

The route of the new pipeline was in an "L" (ell) shape. It was 250 ft across the base of the ell, and the vertical leg was about 650 ft long. A manhole was located at each end of the ell, one at the right angle and another in the long leg, about 250 ft from the angle. At this last location, a 25-ft long pit (Pit #1) was dug to allow the 20-ft sections of PVC pipe to be lowered to the depth of the pipeline.

Another pit (Pit #2) was dug at the end of the base of the eli. In addition, a series of vertical sight/relief holes were aligned along the planned path of the pipeline.

The first bore was made from the top of the long leg of the ell to the intersection with the base leg. When the drill stem reached each sight/relief hole, the bore was stopped until the depth and alignment of the drill tip could be precisely determined by direct measurements. The specifications allowed a variation of one in. up or down, and one-half of the pipe's diameter, left to right, from a straight line. If the location of the drill stem was within tolerance, the bore was continued. If it was not, the drill stem was backed up and a correction was made.

When the pilot bore reached the manhole at the angle, the bore was back-reamed 250 ft to Pit#1. The pipe for that section was pushed through the bore hole, using the bore stem as a push rod.

The remaining 400 ft of pipe was pulled through the bore hole as it was back-reamed from Pit #1. The third "run" was installed by boring through the manhole at the angle between the two legs of the ell, along the base of the ell, and into Pit #2. The pipe was pulled into place as the pilot bore was back-reamed.

Roughly, two days were required to install each of the three pipe runs. The pilot bore was made on the first day, and the pipe was either pulled or pushed into place during the back-ream on the second day.

THE RESULT

Selig said the pipeline was straight enough that it could be lamped (a light inserted into one end of the pipeline could be seen at the other end). "We waited 30 days before we TV'ed the line," he said. "That gives the pipe time to move if it's going to, but it was still well within specifications."

Kent Mudd, special projects engineer for the city/parish department of public works, said he is glad the project was a success. My personal and professional concern is that the city/parish gets the best product it can for its investment. After all, I live here and pay taxes, too. The ability to install gravity-flow sewers on line and on grade is a big step forward."

Selig pointed out that the need to install pipelines within tight tolerances is not limited to sanitary sewer lines. "As we move forward, water, gas, and communication lines will all have to be placed much more precisely with HDD than they have been in the past," he said. "Municipalities will assign each utility a very small pathway for their pipelines, and the contractor will have to stay within that area. And, as utilities are crowded closer together, it will be increasingly important to maintain low hydraulic pressures to prevent damaging those already in place. The ArrowBore process allows us to meet these criteria now." **PW**

ArrowBore

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