

CASE STUDY

**A HIGH STAKES JOB:
INSTALLING 54 PIPES
UNDER A CALIFORNIA
TECH CAPITAL**

Learn about the custom solutions engineered to address installing this much pipe in a maze of underground utility...all during a storm.



THE SITUATION

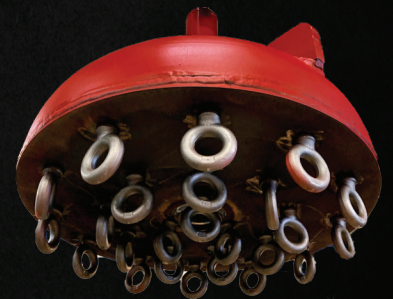
On a rainy week in San Mateo, California, LT Directional was up against some mighty odds. Not only was Mother Nature on their tails with some major rains threatening the productivity of the job, but they also were in a metropolitan area that put them up against public transportation railway on the surface, as well as the risk and hazards that come with drilling next to that—but they also were also battling an especially complex maze of existing underground utilities under the surface.



With some major high-tech companies headquartered in neighboring streets, such as Survey Monkey, Sony Interactive, and GoPro, they had a lot to lose if they inadvertently hit some existing underground power or communication utility lines along the bore path.

The crew's safety was paramount from minute one as they arrived on the scene at 6 a.m., ready for the safety briefing. It was made clear that the weather was not going to be favorable or sunny anytime before sundown, so with several hundred feet to bore, it was going to take full alertness from every member of the crew, from rig operator to mud specialist.

That job was to install 54 x 4-inch pipes over 500' that paralleled the San Mateo rail. This meant there were a few different factors to consider for the job. Over the course of this article we'll deconstruct how LT Directional went about tackling the daunting task and ended with a successful bore with 54 new pipes installed in the heart of a very high-profile, busy city.



BORE HOLE SIZE



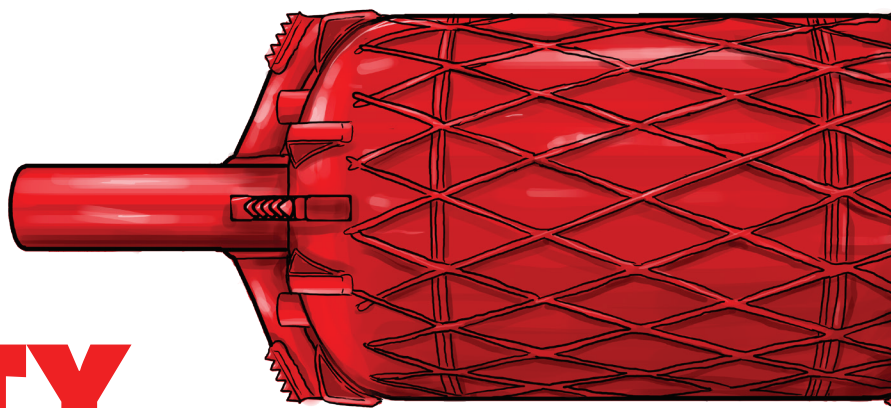
The right hole size is a mix of granting enough room for the product, a reasonable clearance for cuttings to flow downhole, but not be so large that it leaves a void.

The job's 54, 4-inch pipes needed to be installed in two bores running parallel to each other. So, each 500 ft. bore would hold 27 pipes. The reamer and bore hole measurements needed to be precise and pre-determined to mitigate any unforeseen circumstances. Of course, the weeks preceding the job didn't forecast rain...that surprise came at the last second.

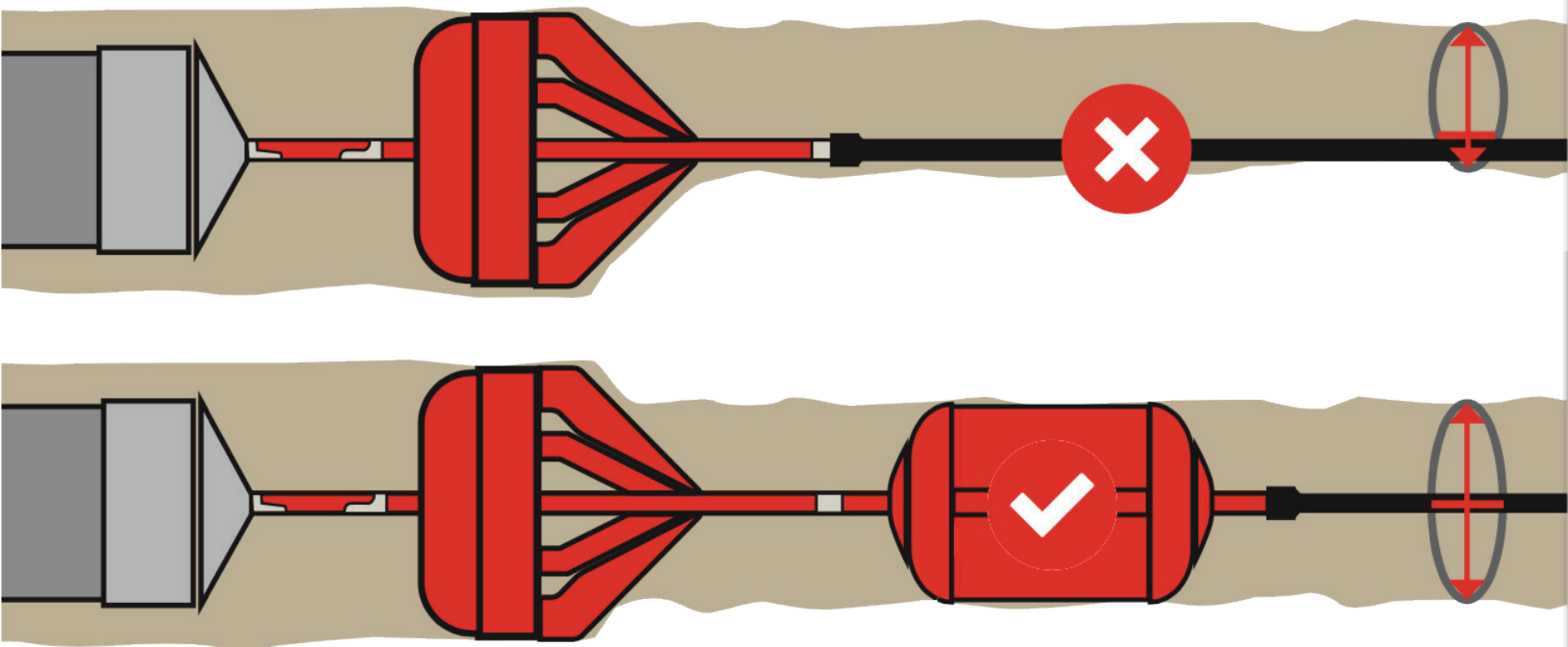
27 pipes don't go in one-by-one. They would need a large enough hole to ensure that all 27 could safely be installed all together without the risk of losing a single duct. 27 pipes would call for a 27-way multi-duct puller, a reamer, and a barrel stabilizer. The barrel would ensure the hole's wall pack remained strong and the hole open. Their calculations determined the final hole size would need to be at least 32 inches in diameter. This would be large enough to provide clearance for the pipes to pull freely without creating a suction that often accompanies the deadly combination of too little clearance in a whole with not the right mud recipe. When you create a hole that large in the shale, clay, and sand composite mixture that you often find in Northern California, suddenly, the wall pack becomes a concern as well...which leads to the next factor.



HOLE WALL STABILITY



With a 32" hole, there is a lot of room for gravity to take over, and the hole collapses. LT Directional worked with the Melfred Borzall [local HDD specialist](#) to get the right mud mix for the rainy conditions, but they also decided to opt for a barrel stabilizer to ensure the wall pack's integrity stayed strong. They opted for the [Deluxe Barrel Stabilizer](#), or "pig," from Melfred Borzall with added hardfacing, mudflow ports, and cutter teeth options. It proved to be a wise choice as they reamed and pre-reamed before pullback. It helped pack the hole and keep the reamer centered in the pre-reamed hole to avoid a mishapen hole that might have resulted in damage to the pipes.





MUD & FLUID MANAGEMENT



This was the sticky part (pun intended). With the steady light rain and the necessity for mud flow to be just right, the mud specialist had to be on point that day. With a proper mix of bentonite and Melfred Borzall's Drill Kleen Plus additive, they could keep the right amount of viscosity to keep the cuttings moving downhole. It did not come without some effort, though - with the rains, LT Directional called to bring in a vac truck to suck out some excess mud and not risk the bore.





CUSTOM TOOLING

Average tooling was not going to cut it for this big of a job. Having experience with larger diameter HDD jobs, LT Directional knew that a custom setup as needed to get all pipe installed safely. The tooling setup they decided upon was a 32" Deluxe Barrel Stabilizer & [Tornado Reamer](#). This setup would simultaneously provide the needed mixing and pumping action for the ground type with the Tornado's blades, and the wall-pack stability that the Barrel provides. Northern California is known for its varying conditions as much as it is for its rocky, hard drilling and they knew they couldn't risk cutting any corners.

One thing is for sure—you will encounter more than one ground type within a bore that is deeper than 18 inches! This job was no different. Running a [JT100 drill rig](#), this crew encountered rocky conditions but also ample amounts of sand that could result in the hole collapsing. Their choice in the Tornado's large paddle cutter blades paid off as it provided the mixing action needed and mitigated the risk of balling up.





27-WAY PULLER

They trailed the reamer & barrel setup with a swivel and custom-manufactured multi-duct puller from the Melfred Borzall engineering team. The multi-duct puller had 27 eyes connected to 27 DCD [Deluxe Duct Pullers](#) that protected the pipe ends with a bell.

Melfred Borzall engineers had a challenge ahead of them as they had to build this from scratch and tailor it to the specs of LT Directional's job. It required engineering a method to keep the package as small as possible, but provide clearance for each of the 27 pipes to safely attach. After sharing designs, collaborating, and finalizing the puller, it was tested and delivered by their Northern California HDD specialist.



In our 77 years of manufacturing HDD tooling we have seen all kinds of ground conditions and situations. We see contractors succeed when there is a firm grasp on the fundamentals of operations and the creativity to engineer solutions with us that are specific to the current job.

- Peter Melsheimer

Vice President of Sales & Marketing at Melfred Borzall



IN CLOSING...

Taking all the proper safety precautions with the crew members, a spot-on mud mix, and the correct tooling choices that were customized and tailored to this specific job enabled LT Directional to have a successful day. With no more than a few feet of clearance on either side of the bore, the rig operator had a great day as he successfully threaded that needle, and the crew was done before sundown.

This was a great example of careful planning, proper preparation, and investment in the right areas to ensure a successful job...even when Mother Nature isn't cooperating with the job.

Do you have a job or challenge that requires a custom solution to ensure productivity or find it. Melfred Borzall is up to the challenge and we can work with you for success.



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