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Corbitt & Sons Construction took on a seemingly impossible project and successfully placed thirty 4-in. (100-mm) PVC conduits in a single directional bore. But that wasn't the original plan.

Conduit Holds Key to Project Success

By Bob Greene

The White River Park, located in central Indianapolis, Ind., is surrounded by attractions that pull visitors in from all over the world.

Within easy walking distance are the city's convention complex, a huge sports dome, a zoo and historical attractions such as the old canal that runs through the park. The state recently decided to build a new facility for the Indiana State Museum in the park. According to Jeff Myers, museum assistant director, the $65 million project more than triples the amount of the museum's current space. The museum will occupy two buildings separated by the canal and the old national road beside it.

To connect the two buildings, museum officials decided to have a contractor either auger or directionally bore under the canal and the road. The contractor would then pull in a 36-in. (900-mm) steel casing to accommodate thirty 4-in. (100-mm) PVC conduits. Only one contractor would respond. After taking a closer look at the project, Corbitt & Sons Construction informed F.A. Wilhelm, the general contractor, that it couldn't be done the way they wanted.

The original plan was to excavate to a depth beneath the canal to set up the boring rig. They would also excavate down to the basement level on the other side of the road. The problem was that even at that depth there were other utilities running under the canal and road that would have to be avoided. They would have to dip down and then come back up at too severe of an angle.

It was questionable whether even the drilling rods would take the stress of such an angle, let alone pull a 36-in. (900-mm) casing into it. The casing was out of the question.

As another option to get 30 pipes

under that canal, William Sears, Corbitt's project coordinator, proposed that they would do three directional drills, hooking onto 10 conduits after each drill and pulling them in behind a backreamer.

That compromise was accepted, but the pipe they used had to be approved by the state and also had to be Underwriters Laboratories (UL) listed. This eliminated the HDPE pipe Corbitt typically used. The rigid plastic electrical conduit would not hold up to the stresses sure to be experienced in such an extreme pull. It looked like another dead-end.

The crew hooked all thirty 4-in. (100-mm) pipes behind a 36-in. (900-mm) backreamer to successfully pull them through.

A Solution

Carlon, a plastics extruder based out of Cleveland, Ohio, had recently developed a UL-listed Schedule 40 plastic pipe that was designed for boring applications. Wilhelm suggested that Corbitt use the Carlon® Bore-Gard®.

Jason Smith, Corbitt's HDPE fusion technician, was skeptical. He thought there was no way the PVC would make it through that bore. Even if it did not crack to pieces under the stress, it wouldn't hold together. It came in 10- to 20-ft (3- to 6-m) sticks and was joined together with a thin nylon strap — no fusion, no glue, no screws. Corbitt refused to accept liability if the pipe failed. Wilhelm agreed to it.

Using a Vermeer D80 rig, 15-ft (4.5-m) rods, and a 6-in. (150-mm) pilot bit, the first shot at the 180-ft (55-m) bore was attempted. They lost the signal, so they had to pull it back. A combination of depth and interference from the other utilities really made it tough.

On two other attempts, they broke drill rods and lost expensive heads.

Many contractors would have given up before then, but Steve Corbitt, owner of Corbitt & Sons Construction, was quite tenacious. His crew even attempted several bores at night to see if there would be less signal interference.

By their sixth attempt, they had lost more than $15,000 in equipment. Everybody unhappily agreed this would have to be their last shot . . . it was successful! Due to the difficulties and cost, it would be unfeasible to attempt two more bores.

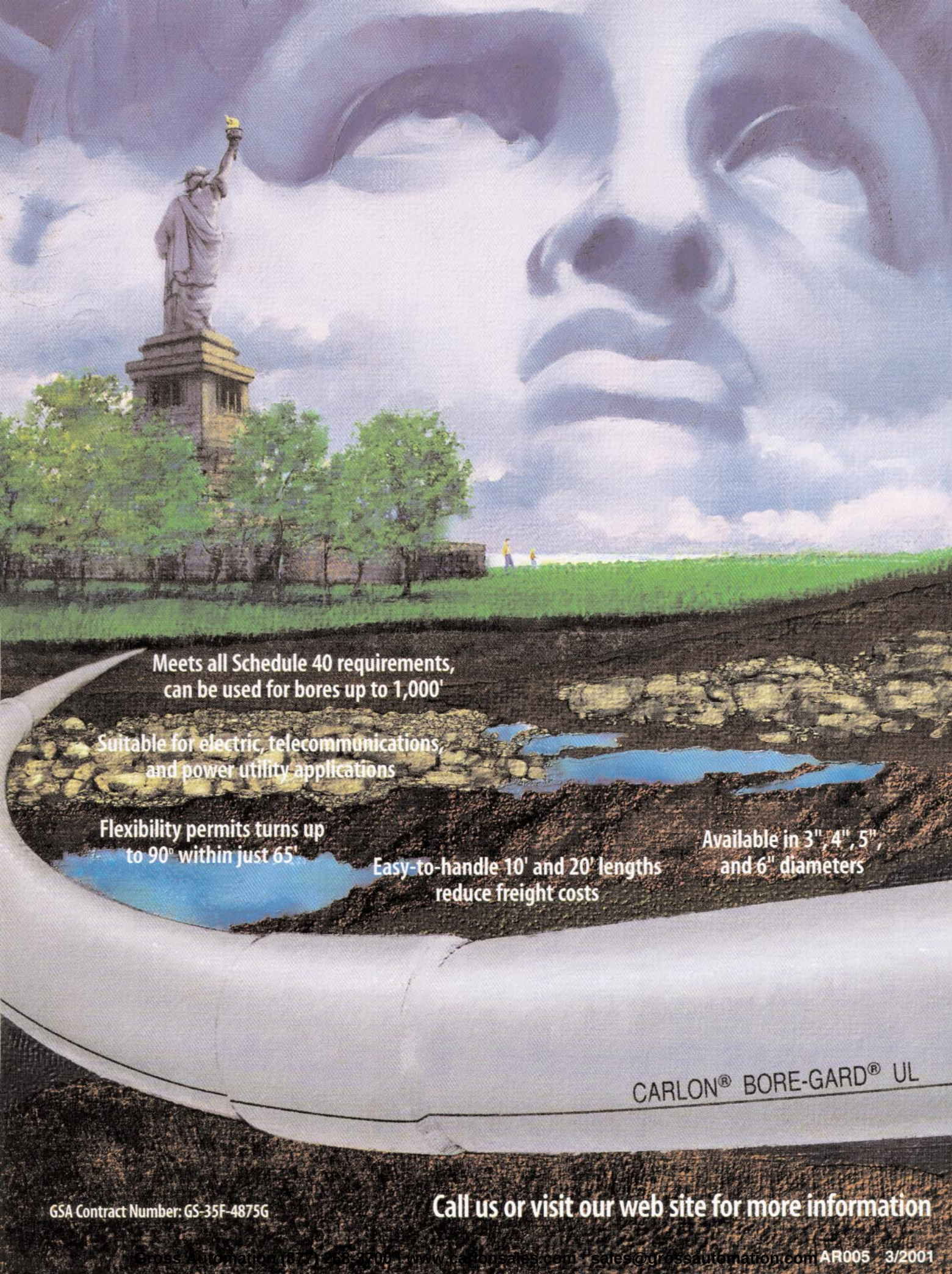
Going For Broke

The decision was made. They would back ream with 16-, 26- and 30-in. (400-, 650 and 750-mm) reamers and then hook onto all 30 pipes behind a 36-in. (900-mm) backreamer. It was quite a risk, but any other options would have cost much more than the plastic pipe they might lose in this attempt.

Not only would there be unbelievable forces at work on the pipes, but most of the worst forces would be on the conduits on the outside of the bundle. For the next few hours, everybody was anxious. Smith said the cakewall started breaking down part way through and the pull was hitting about 22,000 lbs (98 kN). He cringed to think about what was happening to the pipe.

When the backreamer came through, Smith expected to see a bunch of busted up plastic following it. Amazingly, every duct was intact. When tested, every piece of the Bore-Gard pipe proved that it had made it through the tortuous trial unscathed and ready for many years of service to the museum. They were able to use standard PVC couplings, bends and adapters to finish out the job.

Bob Green *is a freelance writer, based in South Bloomingville, Ohio.*



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