

CASE STUDY

CERTA-LOK® PVC PIPE HELPS "GREEN" LADY LIBERTY

When the U.S. National Parks Service conceptualized the 6,700-square-foot Liberty Island Retail Pavilion to open in 2010 next to the Statue of Liberty, the federal agency quickly recognized the importance of bringing an alternative energy source to the glass-walled pavilion designed to greet visitors as they arrive to New York's Liberty Island.

CHALLENGE

While the U.S. Environmental Protection Agency identifies geothermal power as an energy-efficient, environmentally clean and cost-effective energy source, the logistics associated with drilling a geothermal well at one of nation's most-visited sites could interrupt the flow of the more than four million tourists who visit the island every year.

APPLICATION

P.A. Collins Consulting Engineers designed a 1,550-foot deep, ten-inch diameter standing column well. For dip tube and drop pipe materials, the engineers specified durable, corrosion-resistant PVC, allowing contractor Connecticut Wells to choose Certa-Lok® PVC Well Casing and Certa-Lok PVC Drop Pipe from Westlake Pipe & Fittings.

SOLUTION

Certa-Lok PVC Well Casing and Drop Pipe utilize Westlake Pipe & Fittings' field-proven spline-locking design to minimize installation time by instantly forming a full-strength joint in any weather conditions. Moreover, the assembly of pipe lengths requires no solvents, arc welding or reinforcement screw attachments.

"Certa-Lok typically cuts installation time by about 60 percent compared to traditional belled-end PVC well casing and drop pipe," says Anthony Ganio, president of Connecticut Wells. "Plus, there's no need to glue and prime both ends, insert screws and wait for it all to set during joint assembly as with normal PVC pipe. The Certa-Lok assembles as fast as you can put the splines in." Connecticut Wells commenced drilling using a REICHDrill T-650 W drill rig. The upper part of the bore consisted of 17 feet of sand and gravel with solid bedrock encountered at 18 feet. The crew installed 10-inch steel casing to a depth of 80 feet to seal off unconsolidated materials and cement it in place.

Using an air percussion hammer, the crew drilled through the bedrock in 9-7/8 inch diameter to a depth of 260 feet. The hole was advanced in eight-inch diameter to 1,150 feet and six-inch diameter to 1,550 feet. The crew encountered groundwater at depths from 690 feet to 1,330 feet. To maintain the drilling rate and keep the hole cleared of cuttings, the crew used an auxiliary compressor and Hurricane® booster compressor in addition to the air package mounted on the drill rig.

Drilling of the Liberty Island geothermal well spanned five days. After the drilling was complete, Connecticut Wells removed the tools from the well bore and installed 260 feet of six-inch Certa-Lok



Project Type:
Water Well

Application:
Geothermal Well

Owner:
U.S. National Parks Service

Product Used:
Certa-Lok® PVC Well Casing
Certa-Lok® PVC Drop Pipe

Contractor:
Connecticut Wells, Inc.

Engineer:
P.A. Collins Consulting
Engineers

PVC Well Casing and 1,290 feet of four-inch Certa-Lok PVC Well Casing for the well's dip tube.

The crew completed the project by installing a submersible pump within the dip tube and connecting 200 feet of three-inch Certa-Lok PVC Drop Pipe to provide a return line.

Today, ground water beneath the Statue of Liberty travels at a rate of 120 gallons per minute down the well bore entering the dip tube through perforations at 1,500 feet. It then flows up to the pump and circulates back into heat pumps within the Liberty Island Retail Pavilion. In the winter, the heat pumps pull temperature from the 55-degree water and return cold water back to the ground. During the warmer months, the system reverses the flow as the pump transfers heat in the building to the water being used and returns it back underground.

"This type of geothermal well is typical in commercial installations where a large system is present but the surface area will not allow for a larger well field," Ganio said. "With proper planning, everything associated with the project went smoothly. Our crew completed the job without disrupting the flow of tourists or impacting their experience in this historic setting."