INNOVATION DESCRIPTION

Where Used: NYC-DEP CSO-4B
Paerdegat Basin Water Quality Facility
Brooklyn, New York

The Paerdegat Basin CSO retention facility includes a 20-million gallon underground storage tank, with a foundation 400 ft. by 500 ft. and up to 60 ft. deep. A two-foot thick perimeter slurry wall, 200 feet deep and 1,900 feet long, encloses the structure, supported by 926 soil tieback anchors with 70-ton, 120-ton, and 150-ton capacities on three levels.

Innovation: A machine was developed for the efficient installation of high capacity tiebacks into sandy soil by treating tiebacks like pipe piles.

The body of the machine is a Manitowoc Model 3900W crane. The boom of the 3900W is removed and replaced with an inclined carriage welded to the body. A Vulcan 50-C hammer, seated in the inclined carriage, is used to top drive the casing. A 1400 Ingersoll Rand compressor is mounted on the rear of the 3900W.

This configuration allowed ± 70-foot long anchors to be driven through a previously cored hole in the concrete slurry wall, and into the sand layer at design locations.

Replaces: Conventional rig drill for tiebacks.

Why Innovative: The technique allowed for the installation of a continuous length of high strength (grade 150) steel bar.

The technique, developed specifically for the sandy site geology, also enabled high production. An average of 10-12 tiebacks were installed per day utilizing this method. More conventional methods would have yielded an average installation rate of two to three tiebacks per day.
From September 2003 to December 2003, 718 tieback anchors were installed with this tieback machine at Paerdegat Basin CSO Retention Facility, Brooklyn, New York.