

**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.

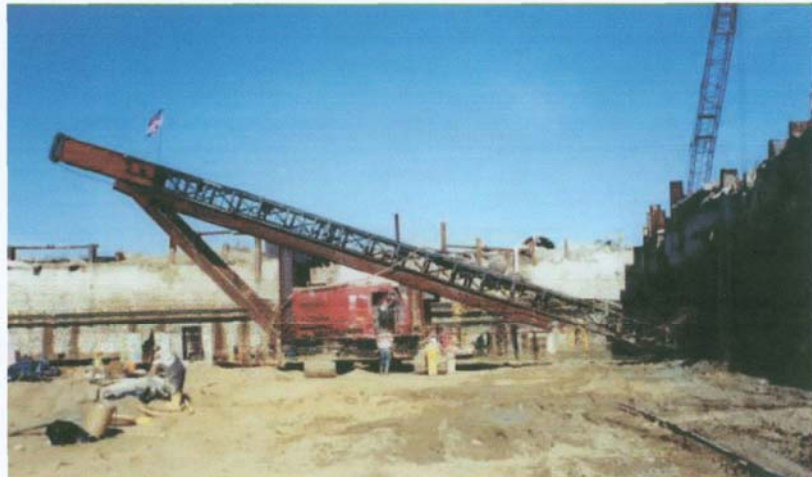
This configuration allowed  $\pm$  70-foot long anchors to be driven through a previously cored hole in the concrete slurry wall, and into the sand layer at design locations.

***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.

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From September 2003 to December 2003, 718 tieback anchors were installed with this tieback machine at Paerdegat Basin CSO Retention Facility, Brooklyn, New York.