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TECHNO METAL POST
Quebec, Canada

ABOUT

Techno Metal Post designs and manufactures helical piles, specialized installation machinery and any other element required for permanent and temporary support work.

APPLICATIONS

- Foundation Repairs
- Protective Foundations
- Marine Foundations
- Residential Foundations
- Foundations for Tourism-Related Structures

NOTABLE PROJECT

Abbot Creek Mitigation Bank

Techno Metal Post - South Jersey (TMPSJ) originally became involved with the 35-acre Abbot Creek mitigation bank project in February, 2016.

TMPSJ was tasked with designing, fabricating, and installing a support-and-hold-down system for steel trash racks that were to be installed on the end of reinforced concrete pipe (RCP).

The trash racks were at the end of RCP cross drains, that in the event of flood water, would be able to recede through back to the tidal waterway.

The purpose of the trash racks was to stop trash, or other floating debris, from impeding or propping open, the tidal check valves during a flood event.

Once work was started by the general contractor and the RCP was installed, a secondary problem presented itself after the valves were installed.

The weight of the valves lifted the opposite end of the RCP and disconnected the first section of pipe from the rest of the run.

TMPSJ was additionally tasked with the design, fabrication and installation of a support system for the RCP and valve.

With the project deadline looming, TMPSJ utilized its broad network of resources to design and fabricate the brackets and hardware for both portions of the project.

TMPSJ was able to expedite the process by employing engineers from across the country and Canada. The engineer tasked with the RCP support structure was based in Alaska.

The four-hour time zone differential allowed for the design process to take place overnight. The project engineers in New Jersey were able to review the redesign the following day.

This near-24-hour workday
COMPANY SPOTLIGHT

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drastically lowered the time needed to have approved drawings for the assembly completed and allowed fabrication to start within days of being tasked with the project.

The trash rack brackets were designed by TMPSJ and the corporate-based Canadian engineering staff of Techno Metal Post.

The fabrication of both structures required TMPSJ to employ three separate metal fabrication companies, in addition to its in-house fabrication abilities, to have all the required pieces produced on-time and on-budget.

In addition to the brackets and support structures, TMPSJ mobilized the required equipment and materials for the deep foundation portion of the project.

The RCP support system is a gravity-support pipe slide with helical piers for the foundation.

The slides were comprised of a steel beam spanning two helical piers and a curved steel plate that was rolled to match the radius of the RCP.

The helical piers, beam and support plate sizes were based on the combined weights of the RCP, the valves and the water weight of an entirely filled pipe.

The trash rack brackets were comprised of a system of four helical piers, one in each corner of the rack, a flat steel bracket to support the racks and steel straps bolted across the round steel bars of the rack to resist lateral and tension loads.

The helical pier design was performed by TMPSJ, the engineering staff of corporate TMP, and the engineering firm hired by the general contractor in New Jersey that was tasked with the final approval of the structures.

Using the empirical data obtained by TMP over years of installations and a detailed geotechnical report, the helical piers were installed to depths ranging from 5 feet to 35 feet and compressive load capacities ranging from 3 kips to 27 kips.

TMP P1 piers were used for the trash rack supports since the total loads were under 6.8 kips.

There were a total of five trash racks, each with four helical piers.

TMP P2 and P3 piers were used for the slides based on the total loads and depths required to reach the bearing capacity needed to properly support the pipes.

There were a total of 16 helical piers.
installed for seven pipe slides that supported nine pipes.

The installation of both systems took place over a two week period and required the general contractor and TMPSJ to work closely together.

The general contractor provided all site support, on-site mobilization and heavy equipment support for the installation. The general contractor also provided temporary berms to impede water flow, constant pumping to keep the installation areas free of standing water, and moved the trash racks into place over the brackets.

They also removed RCP, as needed, to allow the installation of the helical piers and brackets for the pipe slides.

Some of the installation locations benefited from installing the helical piers while the RCP was in-place and bridging a platform between them before removing the pipe for the beam installation, while others required the RCP to be removed and temporary work areas be constructed from which to install.

The helical pier installation was performed by a team of installers utilizing the R2-D machine.

The small-wheeled machine allowed for easy access and movement around the job site, specifically working around the general contractor’s other work on the project.

The project was just over two miles long from one end of the berm to the other. A single-lane road was built on-top of the berm in the middle of a marsh with a tidal waterway snaking its way through the site.

Since the general contractor was working on the entire project and constantly running tracked dump trucks, bulldozers and excavators from one end to the other, the small footprint of the Techno Metal post installation equipment limited the impact on the other tasks being performed and did not impede the travel of the road.

The project site was a marsh, thus, the only way in and out was with the help of tracked dump trucks.

The R2-D is small and light enough to be lifted in and out of the dump truck and moved from pipe to pipe.

Upon completion of the installation of the helical piers and supports, conformity reports were compiled by TMPSJ and forwarded to our primary engineer based out of New York who reviews all of our projects, confirming the design and actual field conditions match and the installation was performed properly. A stamped report was sent back to the client for their records and to the authority having jurisdiction (AHJ) for code enforcement.

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