

# CHANCE HELICAL PILE Civil Construction FOUNDATION REPORT

## A CASE HISTORY

Chance Civil Construction Distributor:  
DANBRO Distributors, Philadelphia, Pennsylvania

**Project:**  
Interstate Storage & Pipeline  
New Bridge Design & Construction

**Structural Engineer:**  
W.J. Castle, P.E. & Associates, P.C.  
(Member of THE CASTLE GROUP)

**General Contractor:**  
Hydro-Marine Construction Co., Inc.  
(Member of THE CASTLE GROUP)

### Background Information:

Due to the construction of a new "Light Rail System" by NJ Transit, Interstate Storage & Pipeline, a major jet fuel supplier, had to create an alternate route to their pump house. THE CASTLE GROUP was retained to pre-design and construct a pre-fabricated bridge.



Due to underground gas lines, overhead power lines, fiber optics, and NJ Transit restrictions, the use of Chance® Helical Piles was an integral part of the design. A traditional footing was unable to be utilized due to the restrictions of the site, including the steep slope of the embankments while the Chance Helical Pile Foundation System enabled CASTLE to work around the limitations.

### Job Description:

Working with NJ Transit, US Army Corp, NJDEP, US Coast Guard and local agencies, THE CASTLE GROUP was able to develop, design and construct the project within budget and in a timely manner.



Initial site visits were done to verify field conditions and determine the best layout and design. Since the new bridge was to cross over a small tidal stream, permits were required from various State and Federal Agencies. Efforts had to be made to ensure that all work performed was limited to the designated areas and not to intrude into the railroad tracks or wetland areas located adjacent to the area.



The bridge superstructure was constructed of steel stringers with diaphragms equally spaced along the length of the bridge. The bridge was prefabricated in two 8 foot wide sections, each measuring 39 feet long.

The bridge was designed for HS-25 loading due to the type of vehicles that would be using the bridge.

Each abutment foundation was constructed of a steel cap beam supported by five 3½" diameter Chance Helical Piles designed and installed for a minimum of 25 tons each.



The steel cap beams were then attached to the Chance Piling with specialized brackets designed by The Castle Group. The backwall and wingwalls were constructed of prefabricated galvanized steel plates welded to the cap beam.



Stone riprap was placed at both abutments and along the channel. A gabion wall [wire mesh encased riprap] was installed along the fence line to act as a retaining wall.

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210 North Allen Street  
Centralia, MO 65240 USA  
Phone: 573-682-8414  
Fax: 573-682-8660

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The bridge sections were set into place and assembled within two hours while the metal deck pans and reinforcing steel were placed in one working day. The 7-inch-thick reinforced concrete deck was poured in place in one day as well.

The approach roadway to the bridge was approximately 780 feet long and was constructed of gravel and stone aggregate with asphalt milling. This type of design was chosen due to the location, type of vehicles using the road, and overall cost compared to asphalt or concrete roadway. Galvanized steel beam guiderails were attached to the bridge on the west approach and a metal swing gate was constructed on the east end of the bridge for security. A 5-foot high chain link fence, approximately 800 feet long, was constructed the entire length between the active railroad tracks and the new roadway and bridge.



The entire construction portion of the project was completed within sixty days for a total cost for the entire project of \$270,000.00, including all engineering.