

Abstract

Since the beginning of trading, transportation via sea has been one of the most efficient ways of transferring goods in and out of a country. Naturally economies strive to maximize this means transport but increasing the size of transport vessels and decreasing the delivery time. As technology advances, so does ship sizes and speed. However, it came to a point where the infrastructure receiving these vessels could no longer accommodate them.

The main obstacle for these vessels was the Panama Canal. Recognized as a significant conflict, the large task to expand the canal was undertaken, therefore allowing the expansion of these larger vessels. This expansion meant that all other port infrastructure around the world must be retrofitted to accommodate these ships as well.

The Bayonne bridge was amongst one of these infrastructures which was in conflicts with the new wave of ships. A whole new higher roadway would have to be constructed partially using the existing structural elements of the bridge. A main aspect of this construction is the design of the foundation. Two types could be used: Drilled Shaft or Micropiles. The decision would be based on capacity, constructability and financial feasibility.

This thesis will analyze and design both types of foundations and select the optimal design.