

Bath-Woolwich Bridge, ME



Mating of follower cofferdam to floating precast footing shell.

Constructing bridge foundations under water is an expensive operation and usually represents 40-50% of the total bridge cost. One way of reducing this cost is to perform as much of the foundation work as possible on shore by prefabrication and then floating (or lifting) completed elements into position. With this objective in mind, Ben C. Gerwick, Inc. teamed with Flatiron Structures Company of Longmont, Colorado to design a floating cofferdam system for the Bath-Woolwich Bridge across the Kennebec River at Bath, Maine.

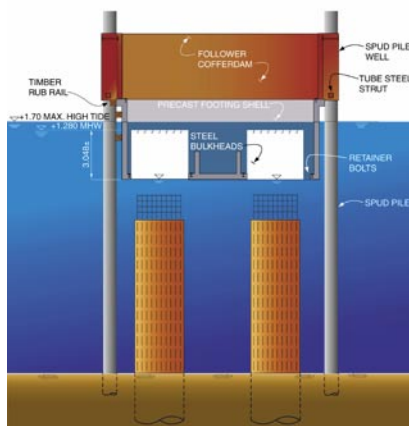
Services Performed:

- Detailed Design
- Constructability Studies
- Precast Shells (Hulls)
- Tremie Concrete
- Casting Yards/Launch System
- Cofferdams and Caissons
- Installation of Large-Diameter Piles
- Offsite Prefabrication
- Positioning Control Systems
- Construction Engineering

deep footing block with the top of the footing about three ft below low tide. This design is very efficient because it significantly reduces the depth at which the footing is constructed. However, it does create the problem of how to construct an underwater footing suspended 28 ft off the river bottom.

In order to address this problem and reduce the amount of work in the river, Ben C. Gerwick, Inc. proposed the following construction sequence:

- Pre-install the drilled shafts using a two stage template.
- Construct a precast footing shell on shore and attach a temporary steel follower cofferdam.
- Launch the cofferdam and tow it to the bridge site.
- Position the cofferdam over the drilled shafts and fix it in position with four spud piles.
- Lower the cofferdam down over the pre-installed drilled shafts with jacks located on top of the spud piles.
- Lock the footing to the drilled shafts by placing a four ft deep tremie seal.
- Dewater the cofferdam and construct the footing and pier shaft in the dry.
- Flood and remove the follower cofferdam for reuse on the next pier.



Float-in cofferdam.

The Maine DOT awarded the design-construct contract for the 3,000 ft long four-lane bridge to Flatiron and Figg Engineers in August of 1997, and shortly thereafter Ben C. Gerwick, Inc. was contacted by Flatiron to design a safe and economical cofferdam system for the six main river piers. Figg's design for the piers was based on using eight ft diameter drilled shafts. A typical pier foundation is located in 45 ft of water and contains four drilled shafts supporting a 33 ft by 36 ft by 12 ft

This construction sequence minimized work in the river and allowed the drilled shaft installation to proceed concurrently with the onshore fabrication and launch of the cofferdams.

Year of Completion: 2000

Construction Cost: \$35M

Client: MAINE DOT,
Flatiron Structures Company LLC