

Admiral Clarey Bridge - Segmental Precast Floating Pontoon Draw Span Bridge

The 4700 foot long Admiral Clarey Bridge connects Ford Island in the middle of Pearl Harbor, HI, with the shore of Oahu. The bridge is the key to the US Navy's development of the 450 acre island for much needed housing and other facilities. To preserve views of the historic harbor while permitting the passage of large ships, the Navy and its design-build team developed a low-lying, combination fixed and floating bridge. The main part of the bridge rests on concrete bents sitting on high load capacity, precast concrete piles that were driven in deep harbor sediments and tested in tension mode. The bents supported precast girders carrying precast deck panels. These precast elements accelerated the construction of the over-water deck and eliminated the stripping of soffit forms. In the center of the bridge is a 930 foot long floating concrete draw span that can be retracted to create a 650 foot wide navigation channel. Two steel transition spans, that can be raised and lowered hydraulically, connect the floating span to the fixed spans. These three spans were shipped from Seattle, Washington, to Hawaii. To facilitate the shipping of the draw span across the Pacific Ocean, the floating pontoon was designed as three cambered units that provide a level draw span when assembled on site. State-of-the-art analysis and design techniques for both earthquake loading and hydrodynamic forces were used, along with in-situ pressure testing. Finite element analysis resulted in the elimination of intermediate diaphragms in the fixed girder spans, and the use of restrainer keys between superstructure and substructure allowed all the pile bents to resist seismic forces. With its segmental precast pontoon, the bridge is one of only five floating bridges in the world and includes the world's largest movable span.

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