Floating Concrete Structures

Evergreen Point floating bridge.

Although the first recorded use of reinforcing steel in concrete was for a boat for the gardens of Versailles in 1870, and the slump test was developed for quality control of World War I concrete ships, the evolution of modern floating concrete structures has only recently accelerated. Current recognition of concrete's inherent long-term durability, resistance to fatigue, high compressive strength, and economy has resulted in the construction of numerous stationary permanently floating structures, including bridges, wharves, terminals, and offshore oil/gas platforms. In addition concrete's advantages have been highlighted by temporarily floating structures such as concrete gravity base structures, GBS's, some displacing over 1,000,000 tons, and towed to their offshore sites including the North Sea, Arctic Sea, Baltic Sea, and the Atlantic, Pacific and Indian Oceans.

Technological developments such as prestressing, special reinforcement, and high performance concrete have been key to these revolutionary achievements. Ben C. Gerwick, Inc. has been at the forefront of the developments, since the early 1970's.

Sakti Ardjuna concrete floating terminal.

At the present time, there is high interest in the potential for floating airport runways and taxiways in San Francisco Bay, both for the San Francisco Airport and the Oakland Airport. Concepts have been developed by us and others, utilizing high-performance prestressed lightweight concrete. Floated-in structures such as these have the advantages of mass prefabrication at offsite facilities, minimum interference with existing airport operations and greatly reduced environmental impact.

Examples of modern permanently floating concrete structures include:

- **Heidrun Concrete Tension Leg Platform (60,000 m^3 of concrete), in the North Sea.**
- **Troll West Concrete Semi-submersible (46,000 m^3 of concrete), in the North Sea.**
- **N'Kossa Concrete Barge (26,400 m^3 of concrete) off the West Coast of Africa.**
- **Sakti Ardjuna Concrete LPG Terminal in Indonesia, (140.6 m x 41.5 m x 17.4 m).**
- **Floating Concrete Bridges in Washington State:**
  - Evergreen Point
  - Hood Canal
  - Lacey V. Murrow
  - Third Lake Washington)
- **Floating Concrete Bridge in Norway (Bergsoysund).**
- **Floating Concrete Approach Walls for Locks on the U.S. Inland Waterways.**
- **Valdez Floating Concrete Terminal in Alaska, (213.4 m x 30.5 m x 9.1 m).**

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