

FLOAT DESIGN AND ANALYSIS SERVICES

Liftech Consultants Inc.



Liftech Consultants Inc. is a consulting engineering firm, founded in 1964, with special expertise in dockside container handling cranes and other complex structures. Our experience includes structural design for wharf structures, buildings, container yard structures, and container handling equipment. Our national and international clients include owners, engineers, operators, manufacturers, and riggers.

Design Philosophy

Liftech is at the forefront of marine terminal technology and strives to develop new technology that improves terminal productivity and safety. We design functional, environmentally sound structures for the most economical investment. The firm considers its service to be one of converting natural resources and labor into usable facilities that are a blend of aesthetic, structural, and functional considerations. We work well with owners, engineers, contractors, and architects.

Float Design and Analysis

We provide design and analysis services for float structures, including cranes mounted on barges and ships and floats for ferry terminals. Projects include design of the local barge support structure for the Left Coast Lifter, a 1,700-t capacity barge supported shear leg derrick, a post-tensioned concrete float for the WETA South San Francisco Ferry Terminal, two steel floats for the WETA Pier 9 layover berths, and a steel float for the WETA Clay Street Ferry Terminal in Oakland. We designed a pile supported pier, gangway, concrete service float with maintenance shed and crane, and system of pile-moored concrete floats with an array of fendering and mooring systems for berthing up to 12 ferry vessels for the WETA Central Bay Operations & Maintenance Facility in Alameda, and the piling, two new steel floats with associated super structures and mooring berthing systems, three new gangways, and refurbishment modifications to the existing float to allow for greater compatibility with other WETA floats and vessels for the WETA Downtown San Francisco Ferry Terminal.

Wharf and Pier Structures

We provide design and analysis services for wharf and pier structures. Our experience includes the design of wharf and pier structures for large earthquake loads, including cast-in-place and precast concrete systems, as well as steel systems. Projects include a 426 foot wharf in Redwood City, a 550 foot wharf at the Port of West Sacramento that supports a cement unloader, over 5,000 feet of wharves at the Port of Oakland that support container cranes, and a MOTEMS-compliant wharf. The MOTEMS wharf permits continued operations during construction by fabricating most of the structures off site and installing prefabricated components between vessel calls. We evaluated all of the wharves at the Ports of Oakland and Virginia to determine the crane rail capacities to aid the ports in their equipment decisions. We have performed evaluation studies and have justified increased crane girder capacities for over a dozen girder systems. We have performed wharf evaluations for heavy temporary loadings, e.g., moving container cranes over the wharf.

More Information

For more information, please visit the Liftech website: www.Liftech.net

| Client & Location | Year | Project Description |
|--|------|---|
| Power Engineering Construction Co. WETA Downtown SF Ferry Terminal San Francisco, California | 2019 | Designed the piling, two new steel floats with associated super structures and mooring and berthing systems, and three new gangways. Designed refurbishment modifications to the existing float to allow for greater compatibility with other WETA floats and vessels. |
| Power Engineering Construction Co. WETA Central Bay Operations & Maintenance Facility Alameda, California | 2018 | The project consisted of a four-story building and a floating system for berthing 12 ferry vessels. Prime design engineer for the building and marine structures designing portions of the building and floating system and integrating the design of others. Landside design included the building and associated structures. Marine design included a pile supported concrete pier and a variety of designs for the float system, e.g., platform and ramp systems, berthing and mooring systems, float guide and dolphin piles, a maintenance shed, and the access and connection for a pile supported crane. |
| Manson Construction Co. WETA Clay Street Ferry Terminal Oakland, California | 2013 | Designed a 78' long steel replacement float to berth ferry boats. The pile collars are removable and adjustable to accommodate future piles that will be larger than the existing piles. The aluminum walkway has six hinged and mechanically adjustable ramps to allow three different ferry types access to either side of the float. |
| Manson Construction Co. WETA Pier 9 San Francisco, California | 2011 | Designed steel float layover berths for Pier 9 in San Francisco consisting of two short pile moored floats with berthing, mooring, and access systems. |
| Manson Construction Co. WETA SSF Ferry Terminal So. San Francisco, California | 2011 | Designed a steel truss gangway, mooring dolphins, and post-tensioned concrete float to berth ferry boats at the South San Francisco Ferry Terminal. |



**Water Emergency Transportation Authority (WETA)
Downtown San Francisco Ferry Terminal Expansion
San Francisco, California**

WETA is expanding ferry service dramatically to accommodate a significant increase in ridership during the past several years. Part of this expansion includes increasing the overall size of the WETA Downtown San Francisco terminal, adding two new ferry gates, and refurbishing the float at an existing gate. The additional gates and more spacious terminal will significantly improve capacity and quality of service.

Liftech designed the piling, two new steel floats with associated super structures and mooring and berthing systems, and three new gangways.

Liftech also designed refurbishment modifications to the existing float to allow for greater compatibility with other WETA floats and vessels.

Client/Contractor:
Power Engineering Construction Company
Alameda, California, USA



**Water Emergency Transportation Authority (WETA)
Central Bay Operations & Maintenance Facility Design
Alameda, California**

This new Operations & Maintenance Facility is the home base for the SF Bay Ferry fleet in the central bay. The facility will be used to maintain vessels operating on the Alameda, Oakland, Richmond, and South San Francisco ferry routes, and to coordinate emergency transportation services during a regional disaster, disruption in transportation, or both.

Liftech is the design prime for this \$52 million essential facility. On the land, the facility includes an operations and maintenance building, fuel yard, working yard, park improvements, and seawall. On the water, the facility includes a pile supported pier, gangway, concrete service float with maintenance shed and crane, and system of pile-moored concrete floats with an array of fendering and mooring systems for berthing up to 12 ferry vessels.

References:
Power Engineering Construction Company
Alameda, California, USA

C. Overaa & Co.
Richmond, California, USA



**Water Emergency Transportation Authority (WETA)
Clay Street Replacement Ferry Terminal
Oakland, California**

Liftech designed a 78-foot-long steel float as a replacement float at the Clay Street Ferry Terminal in Oakland, California.

The project had an accelerated schedule. The previous float needed to be removed and the new float installed in a single weekend. Liftech worked with Manson to provide a design that accommodated the schedule and allowed for a relatively quick and easy float installation. The float design also needed to accommodate future piles, which will be larger than the four existing piles, so the pile collars are removable and adjustable.

Three different ferry types access either side of the float. Liftech collaborated with Manson and their subcontractors to lay out the aluminum walkway with six hinged and mechanically adjustable ramps to provide this access.

Client:
Manson Construction Company
Richmond, California, USA



**Water Emergency Transportation Authority (WETA)
Pier 9 Ferry Layover Berths
San Francisco, California**

Liftech designed two 80 ft by 15 ft by 5 ft steel floats as layover berths for Water Emergency Transportation Authority ferry vessels.

Each float is moored with three steel pipe piles. The pile collars are removable and their locations can be adjusted several inches to accommodate float placement at other locations.

An aluminum gangway, walkway, and hinged ramp are provided to access the vessel. Utilities are provided to each float.

Client:
Manson Construction Company
Richmond, California, USA



**Water Emergency Transportation Authority (WETA)
South San Francisco Ferry Terminal
Float and Gangway
Oyster Point Marina
South San Francisco, California**

As part of a Manson Construction Company design-build team, Liftech designed a 103-foot-long steel truss gangway, a 45-foot-wide by 115-foot-long post-tensioned concrete float, and mooring dolphins. The float is used to berth ferry boats.

The design includes gangway supports that permit large lateral displacements between the pier and float during seismic events.

The ferry terminal is designed to be operational after a large earthquake.

Reference:
Manson Construction Company
Richmond, California, USA

Erik Soderberg

President, Structural Engineer

Mr. Soderberg is a skilled designer and project manager. He is experienced in the design, review, repair, and modification of a variety of structural and crane related systems including wharves, container cranes, and bulk loader structures. Other structures include crane lift and transfer systems and concrete and steel floats. He oversees the technical and contractual aspects of Liftech's projects in addition to his design work.



Michael Jordan

Chief Structural Advisor, Structural Engineer

Mr. Jordan is an internationally recognized expert in the container crane industry. He has been involved in the evolution of the container industry since participating in the structural design of the first dockside container crane for Matson in 1958. Since then, he has designed the structures of thousands of duty-cycle cranes, prepared numerous specifications for the design of duty-cycle cranes, and investigated fatigue damage problems and major failures caused by fatigue crack growth and brittle fracture. Mike is Liftech's founding principal.



Arun Bhimani

Chairman of the Board, Structural Engineer

Mr. Bhimani is an expert in all phases of container crane and wharf design. He has developed innovative solutions to container crane design problems, including a technique for combining analysis with heat straightening for repairing damaged container crane booms, the first seafastening design for transporting fully erected container cranes on barges, and a structural maintenance program used to periodically inspect cranes.



Catherine Morris

Vice President, Structural Engineer

Ms. Morris has a wide range of experience in the design of buildings, container cranes, and miscellaneous special structures. She is the principal in charge of most of Liftech's building projects. She has worked on all facets of container crane design including the design of new cranes, review of crane designs, design of modifications, and voyage bracing. She has also reviewed and designed reinforcing for barge structures for transport of various equipment, designed chassis storage racks, and analyzed and designed equipment to lift and replace steam generators in nuclear power plants.



Jonathan Hsieh

Vice President, Structural Engineer

Mr. Hsieh is experienced in design, review, analysis, and modification of container cranes, bulk handling cranes, and special structures. His expertise includes crane procurement, fatigue failure investigation and repair, and computer modeling and analysis. He has also worked on structural maintenance programs, seismic design of container cranes, crane instrumentation, and voyage bracing.



Sugiarto Loni

Principal, Structural Engineer

Mr. Loni has extensive management experience and design expertise with marine terminal structures including crane-wharf interface, container and intermodal yard structures, building facilities, and marine structures. He is responsible for contract negotiations, technical oversight, and quality assurance of project deliverables. His work includes managing a variety of engineering projects ranging from small projects with short duration to large projects with multi-discipline coordination. As project engineer, he performs civil and structural design of marine terminal facilities, seismic retrofit design of existing building structures, and civil and structural design of wharves and marine structures.



Kenton Lee

Principal, Structural Engineer

Mr. Lee is experienced in design, analysis, and project management of container cranes, floating cranes, rigging, and special structures. Container and floating crane procurement projects and crane modification projects are his specialty, but he is also deeply involved in other types of engineering projects, such as the preparation of structural maintenance programs and project management of wharf projects and baffle/burner structures in power plant ducts. Some of the technical aspects of his work that are of special interest to him are steel connection design, wind effects on structures, wind tunnel testing, and structural fatigue of steel structures.



Patrick McCarthy

Principal, Professional Engineer

Mr. McCarthy is experienced in ship-to-shore and port yard container crane procurement, modification, reliability, and repairs. His work includes project management, condition assessment, and developing structural maintenance programs and repair procedures. He is Liftech's manager for developing crane technical specifications and helps clients with various aspects of the crane procurement process, including pre-bid assistance, post-award design and fabrication review, and post-delivery structural assessment. He also has expertise in wind provisions, has been involved in wind tunnel and other wind studies, and is an associate member of the Wind Load Subcommittee of ASCE 7.



Derrick Lind

Principal, Structural Engineer

Mr. Lind is experienced with project management, design, review, analysis, and modification of many types of structures, including container cranes, unique industrial equipment, buildings, wharves, and bridges. He specializes in all facets of crane modification, including crane raises, boom extensions, capacity upgrades, and wheel load feasibility studies. His work has included crane procurement, structural analysis and design, checking shop drawings, developing construction documents, and managing design teams and project budgets and schedules.



Simo Hoite

Principal, Professional Engineer

Mr. Hoite is a registered professional engineer with extensive experience in container crane design, modifications, specifications, and procurement, as well as container and rail terminal operations. His experience includes development of innovative RTG and STS crane designs for container terminals. He is also experienced in the heavy rigging industry and has managed substantial design projects including wharf design.



Anna Dix

Principal, Structural Engineer

Ms. Dix is a registered structural engineer in California with experience in the design and analysis of various structures for commercial and industrial clients. Her work includes managing projects, collaborating with clients and manufacturers, structural analysis and design, and site inspection and reporting.



Leah Olson

Principal, Professional Engineer

Ms. Olson has managed multiple wharf and float projects, and has participated in the design, analysis, and modification of wharf and float structures, container cranes, steel barges, and other rigging structures. She has evaluated the behavior of various concrete and steel structures using finite element analysis (FEA) computer software. Her work includes project management, structural analysis and design, and site inspection and reporting.

