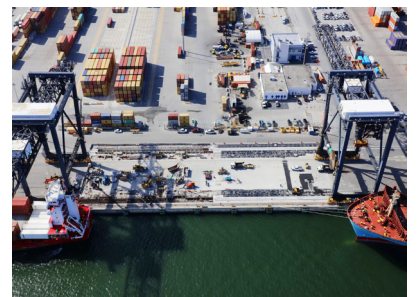
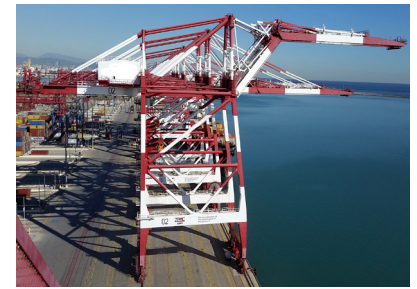


BUILDING SERVICES

Liftech Consultants Inc.



Liftech
LIFTECH CONSULTANTS INC.

Liftech is an internationally recognized consulting engineering firm founded in 1964. Our experience includes structural design for buildings, container handling equipment, and container yard structures. Liftech has clients and projects worldwide. Clients include owners, engineers, architects, contractors, manufacturers, and riggers.

Design Philosophy

Because of Liftech's depth and breadth of project experience and staff, we produce economical, functional, and environmentally sound designs for the most economical investment. We believe in 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.

Building Design Experience

Our building design experience ranges from one-story and two-story tilt-up concrete buildings with steel or wood framing to multi-story braced frame steel buildings. The buildings are generally for port, office, commercial, and industrial uses. In addition to traditional building structures, we also design miscellaneous structures in port terminals including canopies, light poles, guard booths, and truck wash facilities. During the design process, we review our designs with owners and contractors to ensure the most cost-effective design.

Seismic Design

Our experience with seismic design includes evaluation and design of buildings, container cranes, unloaders, and wharf structures. After the Loma Prieta earthquake, we provided structural evaluation of several buildings. After the Guam and Kobe earthquakes, we evaluated crane and wharf structures and helped owners determine the future of their structures. We provided the design reconstruction of a portion of the wharf at Guam. For new cranes, buildings, and other structures, we provide innovative and economical earthquake-sound designs using the latest technology. We have performed seismic studies using finite element time history analysis to evaluate the performance of several container crane and unloader structures.

More Information

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

Client & Location	Project Description
Port of Redwood City Redwood City, CA	Designed a one-story longshoreman building at Port of Redwood City originally conceived to be supported on piles as presented in the design-build RFP documents. Liftech, working with the geotechnical engineer, provided an alternate foundation design using lightweight fills to replace the top five feet of soil, and a structural slab design to distribute the building loads more uniformly to the foundation and to span over differential settlements. The building meets the Redwood City sustainable design requirements.
91 Bolivar Dr. Berkeley, CA	Designed a wood framed office, laboratory, and warehouse building. The building features a three-story lobby, two-story office and laboratory space, and a one-story warehouse area.
Pucci Seafoods, Inc. Hayward, CA	Designed a two-story masonry office building adjacent to an existing tilt-up warehouse building. The design included the new building's framing and seismic system, as well as the strengthening of the existing building for new wall openings.
Therasense Alameda, CA	Designed a 64,000-square-foot office, manufacturing, and warehouse facility. The building has steel concentric braced frames with steel roof and floor framing with a metal deck with concrete floor and a metal deck roof. The foundation system is conventional spread footings. The lobby features a two-story space, and the architectural design exposes the braced frames.
Monte Vista Crossings Turlock, CA	Designed four one-story retail buildings. Three buildings are wood framed, and one is wood roof and metal stud framed walls. The buildings are additions to a growing shopping center in Turlock.
Rainin Instrument World Headquarters Oakland, CA	Designed a 207,000-square-foot, two-story office and manufacturing building. The facility contains executive, engineering, and marketing offices, research labs, a pipette service lab, a manufacturing plant, and distribution facility. The building is tilt-up concrete construction with a steel frame with metal deck and concrete fill mezzanine, and a steel and steel joist frame with metal deck roof. The foundation system is piles with grade beams.
Port of Oakland Berths 57-59 Oakland, CA	Designed three two-story masonry longshore building, a one-story masonry clerk building, three foundations for pre-engineered maintenance buildings, and miscellaneous structures to support the operations in a container terminal yard.
Aviation Maintenance Facility Oakland International Airport Oakland, CA	Designed three single-story buildings for office, warehouse, and maintenance functions for the airport maintenance department. The structural system for all three buildings consists of steel moment frames supported on a pile-supported ground floor slab. The contract for the steel moment frames was specified as design-build to reduce the construction costs.

Client & Location	Project Description
Station Oaks Walnut Creek, CA	Designed a seven-story office building and a four-story split level parking structure. Both structures are over one story of underground parking. The lateral load carrying system is eccentric braced frames for the office building and special concentric braced frames for the parking garage. Both buildings have steel framing with metal deck and concrete fill for the floors.
Tri-Valley Phase I & II Livermore, CA	Designed two two-story tilt-up office buildings with metal deck with concrete fill on steel floor framing.
Port of Oakland Berths 55/56 Oakland, CA	Designed a three-story steel braced frame office building, a two-story braced frame maintenance and repair building, a two-story CMU marine operations building, and miscellaneous structures to support the operations in a container terminal yard.
Applied Signal Technologies Sunnyvale, CA	Designed a two-story tilt-up office building with metal deck with concrete fill on steel floor framing for their Sunnyvale campus.
Fairfield Corporate Commons Fairfield, CA	Designed a 72,000-square-foot, two-story tilt-up office building with metal deck with concrete fill on steel floor framing located in a prominent corner of a business park in Fairfield, California.
APTech Napa, CA	Designed a one-story tilt-up and steel frame office and manufacturing facility.
Plynetics Corporation Alameda, CA	Designed one-story and two-story tilt-up office/light manufacturing building for research, design development, and production of rapid prototyping and tooling for new products. Includes engineering and administrative offices, a warehousing area, and a shipping/receiving area.
Century Analysis Pacheco, CA	Designed a 31,000-square-foot, two-story tilt-up building for the research, design development, and production of computer software. Includes a customer training center, warehousing, and administrative offices.
Dey Laboratories, Inc. Napa, CA	Designed a 75,200-square-foot, two-story tilt-up office and manufacturing facility for pharmaceutical products. Includes quality control and research labs.
Control Manufacturing Company Napa, CA	Designed a 24,000-square-foot, concrete tilt-up building designed to produce electronic control devices.
Port of Oakland Berth 30 Oakland, CA	Designed a three-story steel administration/gate building, one-story and two-story tilt-up maintenance and repair buildings, and a two-story tilt-up marine operations building.



**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



Berth 30 Container Terminal Buildings Port of Oakland, California

Liftech performed the structural design for three marine terminal buildings. The three-story administration building has an eccentrically braced steel frame. The entrance lanes to the terminal are located under the building. The marine operations and the maintenance and repair buildings have exterior concrete walls and steel framing.

The project was awarded a 1995 Honor Award from the American Institute of Architects and the Waterfront Center "Excellence on the Waterfront Award" in 1994.

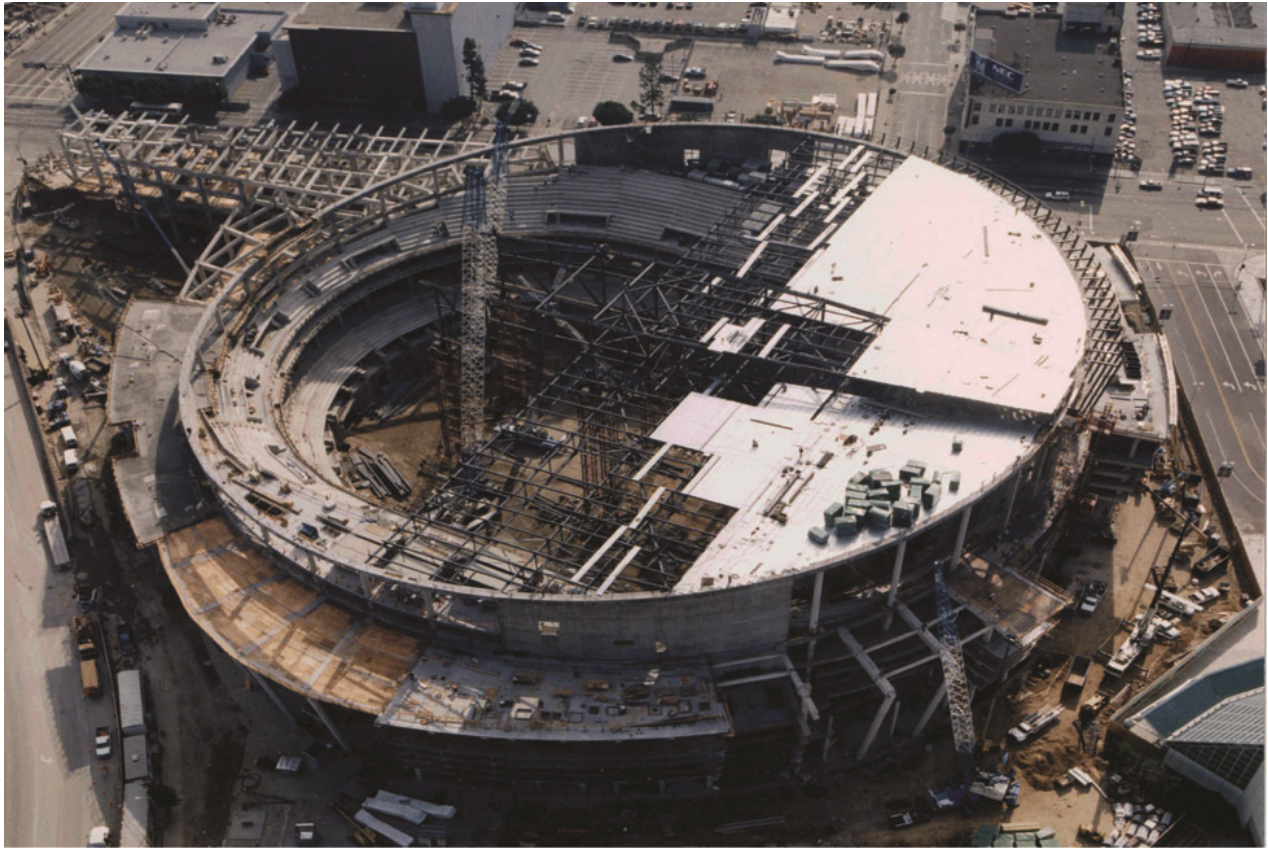
Reference:
Trans Pacific Container Service Corp.
Oakland, California, USA



Container Yard Construction, Berths 55 & 56 Port of Oakland, California

Liftech performed the structural design for this 34-acre container terminal. The terminal includes buildings for administration, marine operations, and maintenance and repair. Other structures designed for special operations included gate structures, reefer wash facility, marine restroom, guardhouse, and trouble kiosk.

Reference:
Port of Oakland
Oakland, California, USA



Staples Center Los Angeles, California

Staples Center, completed in 1999, is the home of the LA Lakers, Clippers, and Kings. Bickerton Iron Works was the rigging contractor selected to assemble, erect, and rig the roof structure. Liftech was retained by Bickerton as the structural engineer.

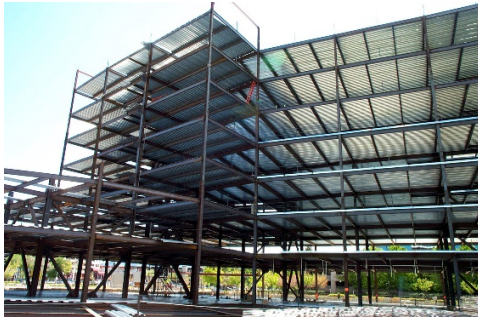
The 435-foot-diameter roof of the arena is supported in the middle by a 64 ft wide x 45 ft deep cigar-shaped truss called the Supertruss. At every Supertruss bay, secondary trusses span from the Supertruss to the arena walls. The Supertruss was assembled more than 100 feet in the air in five sections using shoring towers. Once each Supertruss section was lifted onto its shoring towers, the secondary trusses were put into place, then the roofing and mechanical systems were

installed. This method allowed all disciplines to work simultaneously. When the entire roof assembly was erected, the jacks on the Supertruss shoring towers were lowered until the Supertruss carried the weight of the roof. The Supertruss passed the test of carrying 80 tons of staging, in addition to the roof, for the Grammy Awards.

Reference:
Bickerton Iron Works
Torrance, California, USA

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Station Oaks Walnut Creek, California

Liftech designed this two-building complex on the corner opposite the Pleasant Hill BART Station. The 185,000-square-foot, seven-story corporate office building is linked to a parking structure that features street-level retail and restaurant spaces totaling 15,000 square feet. There is one level of underground parking. The office building is steel with eccentric braced frames. The parking structure is also steel, with concentric braced frames.

Reference:
AECOM USA, Inc.
Oakland, California, USA

Liftech

LIFTECH CONSULTANTS INC.



Fairfield Corporate Commons Fairfield, California

Liftech designed a 72,000-square-foot office building on a prominent corner of a business park in Fairfield, California. The two-story, tilt-up concrete and steel structure features a curved glass entrance.

Reference:
Garaventa Properties
Concord, California, USA



Port of Oakland Berths 57 & 58 Container Yard Construction Oakland, California

Liftech performed the structural design for new container terminal buildings and structures, including masonry longshore buildings, foundations for three maintenance pre-engineered metal buildings, a gear storage building, a clerk/cashier building, gate structures, and other miscellaneous yard structures used for operations and to monitor traffic through the yard.

Reference:
Port of Oakland
Oakland, California, USA



Port of Redwood City Wharf Design Redwood City, California

Liftech worked with Manson Construction Company as part of their design-build team to design a 426-foot-long wharf, two access bridges, a 955-foot-long sheet pile seawall, mooring platforms, walkways, and a longshoreman building. The moment frame and thin deck of the wharf structure limit the seismic forces and number of piles required.

References:

Manson Construction Company
Richmond, California, USA

Port of Redwood City
Redwood City, 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.



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.



Arun Bhimani

Founding Principal, Past President, 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 container cranes, buildings, and miscellaneous special structures. She has worked on all facets of container crane design including designing new cranes, reviewing crane designs, designing 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.



Nicholas Grebe**Principal, Mechanical Engineer**

Mr. Grebe has extensive experience performing conceptual and detailed designs of mechanisms and systems, analyzing dynamic mechanical systems, and developing designs and detailed drawings suitable for manufacture. He is responsible for developing purchase specifications and reviewing contractors' mechanical, hydraulic, and electrical designs for feasibility and contract compliance. He is experienced in reviewing heavy machinery and container crane controls including logic, interlocks, system architecture, and automation features. He provides project management, condition assessment, commissioning, troubleshooting, and acceptance testing of material handling equipment including container cranes and bulk loaders.

**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. He specializes in container and floating crane procurement projects and crane modification projects. He is also involved in preparing structural maintenance programs. 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.



Anna Dix

Principal, Structural Engineer

Ms. Dix has experience in the design and analysis of various steel and concrete structures. Her focus is on ship-to-shore cranes and other structures that reside next to, in, or on top of the water, such as heavy lift and container handling equipment, wharves, and floating cranes. She likes earthquake and fatigue engineering topics and working with clients.



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.



Di Liu

Principal, Professional Engineer

Mr. Liu is an experienced designer and project manager. His work includes structural analysis, design review, modification review, and feasibility studies of container cranes, wharves, and other structures.



Tais Shiratsubaki

Principal, Professional Engineer

Ms. Shiratsubaki is experienced in project management and structural design, review, analysis, modification, and repair of various marine structures including container cranes, bulk material handling equipment, and special structures. She is involved in research and development and enjoys collaborating with clients to produce improved designs and solutions.

