

<b>Client</b>	<b>Year</b>	<b>Project Location and Description</b>
Manson Construction Co.	2007	West Sacramento, California. Designed 550 foot wharf, access bridge, and mooring dolphins for the Cemex cement import terminal.
Esperance Port Authority	2006	Esperance Port Authority, West Australia. Reviewed existing wharf structure capacity for heavier crane.
AECOM USA, Inc.	2005	Port Freeport, Texas: Provided design wheel loads for cranes to service 22-container-wide ships. The wheel loads will be used by the port and the wharf designer to determine girder capacities of a new wharf.
Virginia Port Authority	2004 - 2005	Portsmouth Marine Terminal, Phases 1 through 4 Structural evaluation of the existing wharf capacity that resulted in a 35% increase in the calculated rated capacity of the existing wharf. Increasing the rated capacity eliminated the need to strengthen the existing wharf or to limit crane operations. Structural design of new stowage hardware and its integration with the existing wharf structure.
DP World Vancouver	2004	Vancouver, Canada Provided wheel load study of various 22-wide future cranes. The wheel load estimates will be used by P&O Centerm and the wharf designer to determine girder capacities of a new wharf.
Euromax Terminal	2004	Rotterdam, Netherlands Estimated wheel loads for future jumbo quay cranes capable of serving Suezmax vessels.
TG Engineers	2004	Port of Guam Designed two-berth wharf structure for the Guam Port Authority. Structure included a rail girder and supports for post-Panamax cranes.
Dongbu Container Terminal	2004	Pusan, Korea Investigated tie-down failure resulting from Typhoon Maemi.
Virginia Port Authority	2004	Newport News Marine Terminal, North Berths Structural design to significantly improve the capacity of the existing stowage hardware that involved modifications of the existing hardware, new hardware, and improved integration with the existing wharf structure.
Felixstowe Dock & Railway	2003	Felixstowe, England Predicted wheel loads for placing a jumbo crane with a 120 ton, tandem twin-twenty spreader on a future wharf.
Hutchinson Busan Container Terminal	2003	Pusan, Korea Investigated tie-down failure resulting from Typhoon Maemi.
Port of Oakland	2002 - 2006	Port of Oakland, Berths 32–33 Rehabilitation Structural design for the redesign of a 1500 foot container wharf and a 250 foot wharf extension, to allow cranes to travel between Berths

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		32–33 and Berth 30. Sheet piles were also installed at the toe of the embankment allowing the berth to be dredged to a 55 foot elevation.
Modern Terminals	2002	Reviewed design load criteria on wharf design. Made design changes to increase the crane girder capacity.
		Designed curved rail. Review design of switching system and frog to enable crane transfer between adjacent non-parallel wharves.
Port of Richmond	2001	Port of Richmond, Terminal 2
		Structural design of repair of wharf after ship collision. Several piles were damaged. Liftech designed a repair consisting of new piles and wharf deck strengthening required by the new piles.
Port of Oakland	1999 - 2000	Port of Oakland, Berths 57–58
		Structural design and fabrication review of a new 3000 foot container wharf, which uses 48 inch diameter cylinder piles and standard 24 inch prestressed piles in combination with cement deep soil mixing (CDSM). Liftech also developed a new ductile shear key design for use between wharf sections that is economical and easily repairable.
Port of Oakland	1999 - 2000	Port of Oakland, Berth 25
		Structural design of repair of wharf after ship collision. Several piles were damaged. Liftech designed a repair consisting of new piles and a pile cap under the wharf deck required because of the new piles.
Marine Terminals Corporation	1999	Port of Los Angeles, Berths 121–126
		Calculated wheel loads and provided recommendations on the acceptability of operating the ZPMC cranes on Berths 121 and 126. Investigated how much the outreach of the existing MHI cranes could be increased based on the allowable wheel loads of the berths.
Port of Oakland	1998 - 2000	Port of Oakland, Berths 55–56
		Container yard improvement for Berth 55. Interface with wharf construction. Structural design of yard structures and buildings.
Sverdrup Civil, Inc.	1998 - 1999	Port Everglades, Berth 30
		Design of curved rail, switches, and frogs to enable crane transfer between adjacent perpendicular wharves.
APL Limited	1998	Port of Kaohsiung, Taiwan
		Review of wharf and crane girders for post-Panamax cranes. Designed stowage and tie-down wharf hardware for existing IHI cranes.
Transportacion Maritima Mexicana	1998	Port of Manzanillo, Mexico
		Reviewed wharf extension and provided design of cable trench and panzer belt system.
Gee and Jensen Engineers	1988	Tampa Bay Port Authority, Berth 212
		Curved rail design.
Guam Port Authority	1993 -	Port of Guam, Berths F3–F6

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	1998	Structural design for replacement of an earthquake damaged container wharf with a new concrete deck on pile structure.
Port of Oakland	1994 - 1997	Port of Oakland Wharf Study Conducted an extensive wharf and crane study to help the Port in their overall planning. Calculated the ultimate wheel load capacity of all crane rail girders, waterside and landside, at all dockside container wharves for current and future channel depths. Calculated the wheel loads of all the dockside container cranes at the port.
Transportacion Maritima Mexicana	1995 - 1997	Port of Manzanillo, Mexico Wharf review for future post-Panamax cranes. Reviewed repaired wharf for a post-crane loading and provided the design of the wharf infrastructure for the new crane.
Virginia International Terminals	1996	Norfolk, VA Calculation of the ultimate wheel load capacity of the waterside and landside crane rail girders at all dockside wharves at Norfolk, Portsmouth, and Newport News. The calculated capacities were used by the Port to determine which existing cranes may be relocated to other wharves.
APL Limited	1996	Port of Kaohsiung, Taiwan Review of the wharf structure for new post-Panamax cranes.
Port of Oakland	1995	Port of Oakland, Middle Harbor Terminal Pile replacement and wharf reconstruction for channel depth increase. Some existing wharf batter piles would intrude into the ship berth if the berth were to be dredged to a deeper depth. Liftech prepared a study to determine which piles should be replaced and designed the installation of the replacement piles.
Transportacion Maritima Mexicana	1995	Port of Manzanillo, Mexico Wharf damaged during a 1995 earthquake. Provided the initial damage assessment of the wharf and crane structures, and assisted TMM with the securing of the cranes, and emergency vessel operation. The wharf was repaired by the Port Authority of Mexico.
Korea Container Terminal Authority	1995	Port of Busan, Korea Reviewed BCTOC's wharf facility for installation of a new post-Panamax crane.
APL Limited	1995	Port of Kobe, Japan Investigated wharf damage due to a 1995 earthquake and assisted APL with emergency vessel operation.

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APL Limited	1994	Port of Los Angeles Investigation of wharf damage due to the 1994 Northridge earthquake.
Port of Oakland	1994	Port of Oakland, Seventh Street Terminal Container yard improvements.
Port Authority of Guam	1993	Hotel Wharf Facility consists of an 800 foot long waterside sheet pile bulkhead tied back to sheet pile deadmen. Investigation of wharf damage due to 1993 earthquake. Review of the existing structure and preparation of usage studies for existing wharf facilities.
Port Authority of Guam	1993	Port of Guam, F1 Oil Loading Facility Facility consists of wharf structure, breasting and mooring dolphins, supported on steel pipe piles. The piles and underside of structures were badly corroded. Investigation of corrosion damage to oil loading facility. Provided concept designs for repairs to facility.
Trans Pacific Container Service Corporation	1992	Port of Oakland, Berth 30 Container terminal development. Buildings and site improvements. Structural design of Berth 30 facilities building.
Sea Land Service, Inc.	1992	Port of Oakland, Berth 20 Rehabilitation of north-east corner of wharf.
International Transportation Service	1992	Port of Oakland, Berths 25–26 Transbay container terminal development and yard improvements.
Port of Oakland	1991	Port of Oakland, Seventh Street Terminal, Berths 37–38 Terminal reconstruction.
APL Limited	1991	Port of Oakland, Berth 61 RTG area design for Middle Harbor Terminal.
APL Limited	1990	Fort Armstrong, Honolulu Wharf improvement.
Matson Terminals	1990	Port of Oakland, Matson Terminal, Wharf repair due to damage from the 1989 Loma Prieta earthquake.
APL Limited	1988	Port of Kaohsiung, Taiwan, Berth 68 Wharf improvements.
APL Limited	1987	Port of Los Angeles, Berths 121–126 Wharf improvements.

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APL Limited	1986	Port of Los Angeles, Berths 121–126 Evaluation of crane gird cap.

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