



Construction Management

Client

Port of Long Beach

Location

Long Beach, CA, USA



The crew works on a deck pour while building the crane power trench and utility trench in the outer deck of the wharf. The new wharf was in operation during construction of the last phase.

Pier T Marine Container Terminal Complex

Project Highlights

- Converted the Long Beach naval station and naval shipyard into a new mega-terminal complex
- Met aggressive schedule driven by client commitment
- Resolved environmental issues involved with taking over a contaminated site and preparing it for occupancy through the construction process
- Coordinated multiple contractors who were working on the site at the same time
- Phased construction activities to accommodate terminal tenants' ongoing marine and rail operations
- Maintained direct communications with tenants adjacent to Pier T during the preconstruction and construction phase to accommodate their needs and discuss construction impacts in order to eliminate lawsuits affecting the continuity of operations
- Early phases of the work began before later phase designs were completed, thus making construction management constructibility review and coordination critical to the success of the project
- Coordinated project activities with public agencies and area businesses

Project Description

CH2M HILL provided third-party construction management for this 7 year project that successfully converted the former Long Beach U.S. naval station and naval shipyard into a best-of-class marine container terminal complex for the Port of Long Beach. The massive scale of the new Pier T terminal reflects the promising outlook for trade, and the prominent bright red gantry cranes can accommodate the future breed of super-sized ships. In all, the complex is equal in size to 280 football fields.

Our role at Pier T in supporting the Port of Long Beach was extensive and varied, including contract management, project and schedule controls, construction inspection and reporting, quality control of field work, agency and outside utility coordination, bidability and constructibility review, stakeholder relations, and permitting. The CH2M HILL team's oversight and management activities covered a wide range of construction project tasks, from demolition of the Navy base's 367 buildings and structures, asbestos abatement, and hazardous material removal, to construction management of wharf, landfill, backland, and numerous site buildings, and construction and startup of tenant facilities and accommodation of new container terminal tenants.

CH2M HILL's construction management at Pier T involved coordinating the activities of 21 prime contractors and hundreds of subcontractors engaged in



The South Korea shipping line, one of the world's largest, will operate the terminal under a 25-year lease that calls for Hanjin to pay the Port of Long Beach a minimum of \$42 million a year.

CH2M HILL provided CM for these Pier T facilities

- **Administration Building**, 3-story, 33,500 square feet (sf)
- **Maintenance and Repair Facility**, 71,500 sf, including bridge and monorail cranes, vehicle wash systems, lubricating systems, vehicle exhaust systems, steam cleaners, and vacuum systems
- **Marine Operations Building**, 3-story, 13,000 sf
- **Crane Maintenance Building**, 11,000 sf
- **Main Inspection Canopy**, 30,000 sf with 17 clerk booths
- **Entry Sign Bridge**, with 240-foot clear span
- **Entry Pre-check Area**, with 16-lane camera bridge, 13 electronic truck scales, and 25 communication and camera pedestals
- **Reefer Wash Facility**, 1,100 sf building with 13,500 sf canopy structure
- **Roadability Service Facility**, 1,400 sf with 13,000 sf canopy structure
- **Rail Operations Building**, 2-story, 5,200 sf
- **Drivers Service Building**, 2,200 sf
- **Security Building**, 500 sf
- **Marine Restroom Buildings**, 1,400 sf and 1,500 sf

dredging sediments and soil from the ocean floor to deepen the area, demolishing five concrete piers, and completing a deep draft concrete wharf. Construction of the wharf required filling in the three existing dry docks. This entailed placement of more than 1 million tons of asphalt concrete, 2.5 million cubic yards of import fill material, and rock dikes.

Other major contracts included infill, grading, and paving more than 300 acres of terminal backlands, constructing 14,000 feet of new public roadway, installing new utility distribution and pipeline systems, and constructing 15 structures totaling more than 140,000 square feet. The project also involved tripling the width of the mole and expanding the railroad line by approximately 40,000 feet, making it the nation's largest on-dock rail yard with more than 83,000 feet of rail linked to the newly opened Alameda Corridor.

Pier T's 14 new gantry cranes were shipped fully assembled from China, several to a ship. The cranes are among the largest and fastest in the world and are capable of lifting 100 tons. The overall height with the boom at full extension is 360 feet above the waterway gantry rail. The cab floor is 127 feet above the rail. The cranes can reach across a yet-to-be-built generation of vessels with a width of 22 containers, each 8 feet wide. The largest vessels today are 17 containers wide.

Throughout the years of construction activities, CH2M HILL kept disruption of tenant operations to a minimum through task phasing and regular meetings to ensure clear communication and coordination. In addition, disruption of maintenance tasks and corrective work on tenant facilities was minimal because of quality construction planning and practices.

Key emphasis on the project from its inception was on flexibility and responsiveness in meeting the Port's aggressive schedule for accommodating new tenants. Toward this end, CH2M HILL obtained multiple certificates of temporary and final occupancy from various permitting agencies and readied container facilities for tenant occupancy in August 2002, promptly generating lease revenue for the Port.

CH2M HILL provided construction management for the following contracts on this project:

Demolition. Four individually bid contracts for the demolition of the Long Beach Naval Station. Each contract included asbestos abatement, hazardous material removal, and demolition of 367 buildings and structures that made up the Long Beach naval station, supply depot, and naval shipyard.

Wharf Construction. Three separate contracts totaling more than \$190 million for the construction of 5,000 feet of marginal concrete wharf. Construction included demolition of three existing concrete piers; more than 4,000 feet of concrete seawall; dredging to deepen the Pier T Basin totaling more than 4.9 million cubic yards; dredging and upland disposal of 640,000 cubic yards of hazardous dredge sediments; placement of rock dikes; dredging, placement, and construction of a 35 acre slip fill totaling

"I want to take this opportunity to thank the CH2M HILL CM Team for their extraordinary effort at achieving the successful delivery of this very critical Port program. The CM team led by CH2M HILL was very successful at finding opportunities to mitigate the adverse affects of changed conditions on the schedule through a very proactive approach to schedule management."

Gary Cardamone
Deputy Chief Harbor Engineer,
Construction, Port of Long Beach



Several hundred former naval base structures were demolished and 15 new terminal complex buildings constructed, including the Marine Operations Building for the new tenant, Hanjin Shipping Lines.

more than 750,000 cubic yards; and filling and abandonment in place of two existing dry docks.

Landfill Construction. Dredging and placement of more than 5.1 million cubic yards of rock dike, dredge material, and surcharge material to raise the grade of the backland and increase the terminal's total acreage to 380 acres.

Site Preparation, Site Entry, and Backlands Construction.

Three separate contracts of import fill, grading, and paving of terminal backlands and installation of new utilities. These utilities included several thousand feet of storm drain, water line, sanitary sewer, natural gas, and fuel systems, and electrical distribution, high mast lighting, switch gear, and electrical transformers. This involved coordination with the Long Beach Water Department, Southern California Gas Company, Verizon, and Southern California Edison, among others. Pipeline construction was managed for the Defense Logistics Agency. The project also included building approximately 14,000 linear feet of new public roadway.

Construction of Site Buildings. A contract for the construction of 15 separate structures including a three-story administration building, an 80,000-square-foot maintenance and repair facility, a 10,000 square-foot marine operations building, and approximately 61,000 square feet of additional site support structures.

Project History and Challenges Overcome

The Pier T site was formerly home for nearly half a century to thousands of sailors and civilians based at the Long Beach Naval Station and the Long Beach Naval Shipyard. With the end of the Cold War, Congress closed the naval complex in the mid-1990s and transferred use of the land to the city of Long Beach for redevelopment.

In late 1996, CH2M HILL's Santa Ana office was successful in winning the third-party construction management contract for the Pier T Marine Container Terminal Complex project. Unfortunately, before contract negotiations could be completed, the project was delayed by a series of legal and political actions. It took one and a half years for the City and Port of Long Beach to resolve the various issues holding up the work. Construction on the project started in August 1998 without an established tenant. The terminal conversion reached a milestone in March 2000 with the announcement that Hanjin Shipping Lines would be the tenant at Pier T. This allowed the Port to complete the design of the project to the tenant's specifications and for construction to continue without delay.

The first phase resulted in the employment of 5,500 temporary construction workers under 15 major construction contracts. At the project outset, 367 former military buildings and structures were demolished. The conditions of the site presented a significant challenge. The site contained hazardous materials from former Navy operations, some which were known, many of which were discovered during construction. Undocumented underground obstructions and differing site conditions, many of which

Project Awards Won



- 2005 CMAA Southern California Chapter Construction Management Project Achievement Award for Projects over \$100 Million.
- 2004 American Association of Port Authorities Award for Facilities Engineering Excellence.
- Golden State Award—the state’s top Engineering Excellence honor, awarded by the Consulting Engineers and Land Surveyors of California to KPFF Consulting Engineers, the project designer.

resulted from years of subsidence from oil production activities, also presented major challenges to cost and schedule.

Opportunities for workarounds and selective acceleration were identified to keep the program on schedule. Adverse affects on project cost were also successfully mitigated through the use of value engineering principles and rigorous cost control.