

Marine Civil Engineering

TOA was established at the beginning of 20th century and has been engaged in the development of coastal industrial zones, starting from Tokyo Bay Area. TOA has been contributing to the formation of infrastructure, consolidation of industrial foundation and many project completions for our rich, daily life in various local areas.

Among our completed results, it includes the land development for industrial zones, construction of advanced harbor related facilities such as piers, sea berth, container terminals and warehouses, and colossal building facilities that took long-term construction period. We also provided high level of technology for the construction of airports, artificial islands, bridges and facilities including coastal plants, marina and offshore amusement spots. In the background of these completion of large but quality based marine civil engineering projects, there is the requirement for "modernization" in Japan, and we are confident that we have our specific mission and technology to realize these social needs.

In every project, we always think of the importance of harmony between man and nature. Therefore, we initially investigate and study the topography, soil conditions, water and marine sources of the site thoroughly. We then consider the human factors including culture and industries before we engage in our projects. This results in solid reputation not only in the local societies and industries, but from local inhabitants too.

Future projects for marine civil engineering forecast that they require higher level of technology, more remarkable equipments, richer experience and environmental friendly human nature.

The Central Japan International Airport (Centrair)

The CENTRAL JAPAN INTERNATIONAL AIRPORT is a full-fledged offshore airport with a 3,500m runway. Since it began its services from February 17, 2005, the airport has been operating 24 hours a day, and special consideration has been given to its facilities, systems and operations.

A 470-hectare airport site was reclaimed using 56,000,000m³ of earth and sand, of which 8,630,000m³ of those soil were provided by effectively utilized recycled materials dredged in the Nagoya Port executed by TOA. Our dredging technologies were applied to the reclamation works that contributed to shorten the construction period. The remaining 4,500,000m³ soil came from mountains, and were transported to the site from other areas.

The revetment with a circumference of 12km surrounds the area. The minimum distance between the revetment and the opposite shore is at least 1.1km, and the island was curbed to prevent eddy currents. These measures will help to ensure that any potential impact on the tidal stream from this project is minimized.



TOA's dredging method "Plug Magic" (see page 12 for detail) was adopted in order to maximize the recycle of dredged soft soil.



Kansai International Airport 2nd Stage



In this project, a new 545-hectare airport island is completed to build 200m off the existing island to construct a second 4,000m runway, apron and taxiway. The island needs 250,000,000m³ of earth and sand as it is deep as 19.5m on average at site. The revetment work that began in July 1999 was completed in November 2001, and the reclamation work was completed in 2006. When preparing the ground for an airport, it is important to build a firm foundation free from any ground subsidence. In order to ensure the construction of a firm foundation, TOA utilized various technologies and techniques for this reclamation work. One of the good examples is the use of GPS to ensure the accurate positioning and the height of reclaimed land.

The Yumeshima Container Terminal in Osaka Bay

The YUMESHIMA CONTAINER TERMINAL was planned to upgrade the container berth consisting three submerged type berths of -15m in order to accommodate post panamax and those increasing container transportation that plays a major role in international logistics. The 350m long wharf consists of steel pipe pile foundations driven into the front area of the caisson revetments and the jetty superstructure.

We conducted extensive studies of concrete cold joints and methods to control cracking after pouring concrete over a large area for the superstructure of wharf and achieved greater results than expected in quality assurance and safety control. Learning from the destruction hit on port facilities in the Great Hanshin Earthquake, we designed the wharf to be available for emergency purposes, giving it a -15m and providing it with functions for an earthquake proof structure. As a sole contractor for this project, we were able to make extensive use of our marine engineering technologies and experiences.

The Yumeshima and Maishima linking bridge for floating portion (878m and 410m long, respectively) has attracted the attention for becoming the world's first floating type bridge. When post panamax is navigating, the floating portion of this bridge revolves with a pivot placed adjacent to Maishima.

Construction works of a submerged tunnel for roads and rails, which connects the Yumeshima Island and downtown Osaka to ensure smooth transportation of goods, have been completed. Other than offshore civil works, we have completed the administration building, maintenance shop building for the repair of various port facilities and support of container handlings, and the gatehouse building used for entry and exit of trailers. These facilities are the core of this Yumeshima Container Terminal C-11, which is one of the largest physical distribution site at the Osaka Port.



Sakhalin / LNG Project-Civil Works



Provided by Sakhalin Energy

In Sakhalin Island located in the far east region of Russia, foreign investment are being used as a springboard for the development of the Sakhalin Project. We participated in the Sakhalin II LNG Project for the construction of the LNG loading facility including the placing of 25 reinforced concretecaisson units, foundation works of an oil export terminal and provision of concrete for other contractors taking part since June 2003. The severe weather conditions that were a normal part of the features of this project preclude works on the jetty being carried out during, in particular, the winter period. Great care was taken in the construction for the jetty as the feeding and breeding grounds for many fish and marine creatures were in close proximity to the project site.

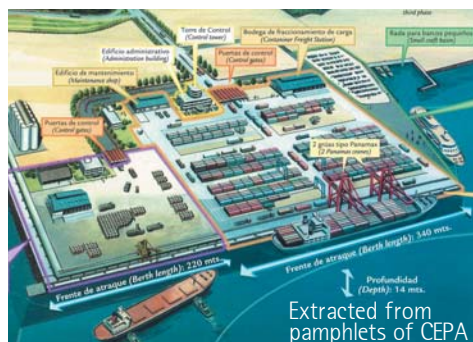
Construction of the Northern LNG Receiving Terminal in Taiwan

The newly constructing terminal inside Taizhong Harbor is the second LNG receiving facility in Taiwan. The terminal is for supplying fuel to one of the world's largest combined thermal power station in Da Tan. The construction projects ordered by Taiwan CPC comprised of three ground level tanks with the total capacity of 480,000m³, a unit of LNG vaporization plant, and a tanker berth.

The Company has been engaged in the construction of a dolphin type berth for a tanker with the capacity of 145,000m³ by organizing a consortium with Taiwanese engineering companies CTCI and RESI, and IHI of Japan. We also received the Golden Award from Taiwan Governmental Committee for excellent quality construction.



La Union Port Multi-Purpose Terminal



Extracted from pamphlets of CEPA

Ever since our first project in Argentina in 1989, we have been continuously working in the American regions, including the countries in the Caribbean. Based on Japan's official development assistance program, we have mainly been involved in the development of fishery relating facilities and have made great contribution to the local residents.

In the year 2005, TOA was awarded the contract for the construction of a new multi-purpose terminal in La Union, El Salvador. Local labor and organizations have been utilized to

great effect on the project and will enhance the local community by bringing them directly into the project from its inception through to completion. This contract has become the largest project funded in this region by the Japanese Government and has also become a great challenge for us.





Saigon Premier Container Terminal



In Viet Nam, the Company has a vast amount of experience and technical data in improvement of soft ground. In July 2007, the Company received an order for the construction of a large-sized private-based international container terminal from Saigon Premier Container Terminal Ltd. (SPCT), a joint venture of world top class container terminal operator, “Dubai Ports World” and industrial zone managing company, “Tan Thuan Industrial Promotion Company”.

The project comprises 520,000m³ dredging works, construction works of jetty and wharf extending 500m, ground improvement work with 24ha in space, paving container yard with 24ha in space, and construction of 9 buildings.

The project site located 17km south of Ho Chi Minh City is expected to expand as a harbor business area in the southern part of Viet Nam.



Newly Completed Projects

The Pasir Panjang Container Terminal in Singapore

Singapore Port is world's largest container transshipment hub connections to 600 ports in 123 countries. The Pasir Panjang Container Terminal is a part of Singapore Port, consist of 23 Container Berths, has a 15m water depth and is equipped with 71 Gantry Cranes that are capable to handle 18 rows of containers hence enabling to receive world's largest containers' ship.

TOA CORPORATION since 2005 have been awarded in the construction of 14 Container Berths (total length 4330m) and a car ferry terminal in 6 separate contract. Currently, we are constructing the last section of container berth of 1300m and it will be completed in 2009.

