

Marine Civil Engineering

TOA was established at the beginning of 20th century, and has aggressively engaged in the development of coastal industrial zones, starting from Keihin Coastal Industrial Zone. 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 are required for 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.

Construction of the Central Japan International Airport

The Central Japan International Airport will be a full-fledged offshore airport with a 3,500-meter long runway. This will be an international airport open around the clock, and special consideration has been given to its facilities, systems, and operations. Due to start service in 2005, reclamation work, revetment work, and terminal building construction are progressing simultaneously. A 470 hectare airport site is to be reclaimed using 56,000,000 m³ of earth and sand, of which 8,600,000 m³ are provided by effectively utilizing earth and sand as recycled material dredged in the Nagoya Port, in which the Company is in charge of reclamation work (Part 1) as a leading company Joint Venture business, after cement-type material is added for solidification. The remaining 4,500,000 m³ consists of mountain soil transported to the site by the sea. A revetment having a circumference of twelve kilometers will surround the airport island. The minimum distance in the sea area between the revetment and the opposite shore will be at least 1.1km, and the island will be curbed to prevent eddy currents. These measures will help ensure that any potential impact on the tidal stream from this project is minimized.



Kansai International Airport 2nd Stage



In this project, a 545-hectare airport island will be built 200 meters off the airport in the first stage in order to construct a second 4,000-meter long parallel runway, apron, and taxiway. The island will need 250,000,000 m³ earth and sand because the average depth of the water at the site is some 19.5 meters deep. The revetment for the project began in July 1999 was completed in November 2001, and full-fledged reclamation work is proceeding along at this time. It is important to build a strong foundation free from any ground subsidence when preparing the ground for an airport. In order to ensure the construction of a strong foundation, TOA is freely using numerous technologies and techniques at the reclamation work site.

Construction of New Hitachi Naka Thermal Power Plant (Coal Unloading Jetty)

Two electric power companies installed on 1,000,000kW generating system each in order to construct a 2,000,000kW coal-fired thermal power plant in Ibaraki Prefecture. In this project, TOA constructed a jetty to unload coals transported to the plant from overseas. One of the features of this work was to make an SRC jacket structure as the main structure of the jetty by making use of the exposed base rock at the sea bottom. Large blocks of the structure were then installed on top using a large crane ship, thereby shortening the work period and reducing construction costs substantially. The foundation work was conducted at a depth of twenty meters and consisted of excavating the soft rock layer by two meters in order to place underwater concrete.



The 2nd LNG Berth at Futtsu Thermal Power Station



To meet with annually increasing demand for the electric power in Tokyo Metropolitan area, it is urgent to construct the LNG (Liquefied Natural Gas) receiving facilities for the combined cycle power generation of Futtsu Thermal Power Station. TOA is engaged in the expansion works for the dolphin type LNG receiving berth.

Construction of Niigata Minato Tunnel at Niigata Port



Niigata city, located in the mouth of Shinano River, is a key port town facing Sea of Japan which exalts the beautiful sea and nature. Securing effective traffic flow between the port and urban district is an important factor for further economic development in the area. In order to facilitate a smoother flow of people and goods between the port and the city, TOA is moving ahead with the construction to connect these two points by an under-river tunnel. The total length of the tunnel is 1,423 meters. It was constructed by the submerged tunnel construction method in which eight hybrid caissons of full-sandwich structure measuring different sizes in width, height and length were joined together. The tunnel was completed in May 2002.

Traffic situation in a big city is a major concern at all times in relation to industrial development of the city and the surrounding region, improving life of residents, and preservation of the environment. The highway links the two cities located on either side of Tokyo: Kawasaki city, Kanagawa Prefecture and Kisarazu city, Chiba Prefecture. Trans-Tokyo Bay Highway has not only contributed in revitalizing lives and industries of the cities on both end, but it also diversified metropolitan function including production, distribution and tourism of Tokyo Bay area. TOA has made full use of its abundant experience and knowledge to implement the difficult construction including man-made island where both tunnel and the bridge connect, and interchange on the bridges.

Trans-Tokyo Bay Highway



Punggol Reclamation Project (Phase 4)



Singapore is a small country and it is important to use the coastline of Peninsula effectively. Housing Development Board (HDB) of Singapore has sincerely wrestled with the development of housing land in the mouth of Punggol district with the reclamation of 11 million m³ of soil, revetment construction of about 10 kilometers in length, and soil improvement works of 5.1 million m³.

TOA completed its reclamation works in the north-eastern coast of Singapore and gained Quality Award from HDB in honor of reclamation work in 2002. There will be 15 new waterfront with resident areas, recreation facilities, shopping centers and marine parks in the future.



Semakau Island Offshore Landfill Project, Singapore

TOA completed and delivered the Semakau Island offshore landfill project to the Ministry of Environment in Singapore. Located between Semakau Island and Sekang Island, some 10km south of Singapore Mainland, this large sized waste-receiving island constituted a major construction project. The project included embankment construction with 7km in circumference, land formation for facility administration offices, construction of an ash-unloading jetty, and construction of the administration building. This involved 20 million m³ of reclamation work, 6 million m³ of dredging, 2 million m³ of stone riprap work and jetty extension of 580m.



Newly Completed Projects

International Terminal for Passenger Boats at Ohsambashi Pier at Yokohama Harbor

This is a renewed terminal opened in December 2002 with a total floor space of 43,843 m².



Honmoku Wharf

TOA has been engaged from the primary stage to the final stage in the construction of the wharf with the world's largest container terminal. In this project, TOA is renewing the conventional wharf to enable the large-sized container to come alongside (projected sea depth of 15.6m and its total length of 700m). The wharf is also to expand its function of transship by constructing a precast concrete-type of quay with aseismatic structure composed of driven steel piles.



Road Construction in Philippines

This is a project to construct the road on the sea of the south bay in Cebu City. The road extending 4,300m on the sea is now constructed by embanking sea which requires the improvement of foundation. The project is completed by TOA's advanced technology of marine civil engineering, such as Paper Drain. In addition, the project includes the construction of the road extending 800m on the land.

