Domestic Projects

3,000-ton crane vessel

Penta-Ocean's domestic civil engineering segment represents the Group's main source of revenues, and during the term, recorded a substantial 50% increase in orders received in the first half of the year. This success was due largely to strenuous Group-wide efforts to increase sales and project efficiency. Despite this success, however, public works projects commissioned by the central and local governments remained severely depressed. Undaunted, Penta-Ocean is determined to use the current economic dilemma as an opportunity to increase its strengths in every aspect of its operations, and in particular, in research and development of new technology and construction methodology.

An example of this prowess, during the term, was the demolition and removal of a submerged fort foundation that was blocking a shipping route at the Tokyo Bay Entrance Traffic Route (Uraga Suido Traffic Route) Concrete Blocks Removal Project.

Although the elimination work was fairly rudimentary for a construction company, with Penta-Ocean's capabilities, the work commissioned by Japan's Ministry of Land, Infrastructure and Transport (MLIT) included the removal of the submerged structure, dredging of a shipping access channel 23 meters deep, and expansion of the heavily traveled Uraga Channel.

This coastal fort was constructed 130 years ago by the emerging government of Japan during the Meiji Era. It was built to prevent the European and U.S. fleets from entering Tokyo Bay, the entrance to Tokyo at that time. When it was completed in 1921, ten years later than initially planned, the fort represented a feat for the skilled marine engineers of the time. The project had been hampered by typhoons and tidal waves and two years after its completion it was completely destroyed by the massive Kanto Earthquake that devastated Tokyo and tumbled silently into the sea. For more than 80 years, the obstruction had posed a threat to ships entering the harbor.

The MLIT required Penta-Ocean to frame the entire structure in order to prevent pollution of the water surrounding it. The concrete blocks forming the fort were reused in another location to create a sanctuary for marine animals and plants. Since there was little information on the fort, Penta-Ocean sent divers deep down to assess the situation and followed that by the removal of massive amounts of sand and soil to expose the structure. A survey was conducted, subsequently, and information on the size, weight and positioning of the blocks was gathered.

The heaviest of the structures to be removed, named the I-700 Concrete Structure, weighed 1,211 tons, and took three months to remove sand and dirt around it, make detailed surveys and reviews, and mount hoisting metals to it. A 3,000-ton crane vessel was used for hoisting it with a total of 32 cables attached to it at a very slow speed of about 30 cm/minute. The removal of the submerged fortification and the dredging and widening of the channel have greatly improved navigation in and out of the port.

Waste Disposal Plant for the 21st Century – Naka Plant

Penta-Ocean has transformed what, traditionally, was considered an unattractive, and purely utilitar-

Hoisting work at Tokyo bay

1,211-ton hoisted concrete structure

Hiroshima City Naka Incineration Plant, Hiroshima


Fish auction area

ian waste disposal complex into a spectacular architectural achievement with high technology systems. The Naka Plant has already become a landmark accomplishment for the city of Hiroshima.

A 10-minute drive from the Peace Memorial Park, Hiroshima's most famous landmark, the site of the Naka Plant is surrounded by Hiroshima Bay and faces the Inland Sea of Japan. In anticipation of the 100th anniversary of the atomic bombing of the city, this facility was designed for state-of-the-art functioning and spectacular design, in line with the city's ongoing beautification plan.

Adopting a bold-patterned glass curtain wall, advanced waste treatment technologies, and an open, transparent design, this is a waste treatment plant suitable for the new century, with due consideration given to environmental safeguards. Adopting glass allows visitors to pass through the interior in transparent tunnels for observing incinerating facilities, while enjoying a beautiful view of Hiroshima Bay.

The new Naka Plant will have an incinerating unit with disposable capacity of 600 tons of waste per day. Excess heat produced during incineration is utilized for generating power, which is used in the plant interior and also sold to an electric power company. Odorous air arising from waste pits is collected and funneled to incinerators, thereby reducing odor in the surrounding area. Ash remaining after incineration is moved to an ash-melting furnace where its volume is reduced to half by electric arc heat and recycled into aggregates for asphalt road-paving materials and other end uses.

To assure prevention of contamination, dioxins and dust are eliminated from waste gases through a filter-type dust collector.

A New Type of Fish Market Opening a New Era

In recent years, food safety has become an increasingly important issue. In a country where seafood makes up the majority of the population's diet, the safe handling and proper preservation of sea produce are essential.

Construction of the Uozu Fish Market was completed by Penta-Ocean during the term and incorporates an advanced, hygiene control system that ensures safety and freshness of all produce. It is a model facility and conforms to all HACCP (Hazard Analysis and Critical Control Point) requirements set down by Japan's Agency of Fisheries.

HACCP is a food hygiene control system for monitoring food safety. The HACCP approval system by the Ministry of Health, Labor and Welfare currently covers products made of milk, meat, and fish curd, but does not cover fish and shellfish.

The Group-wide effort that made the successful completion of this project possible was the result of many years of accumulated expertise in marine and architectural engineering work. Penta-Ocean has a long history in constructing harbor and fishing port facilities in Toyama Prefecture and has earned an exemplary reputation in that region.

To complete the project, Penta-Ocean had to overcome complicated foundation requirements, as the facility is located in the soft and saturated soil


Ceiling hose storage reels


Ultraviolet disinfecting and filtration unit


Uozu Fish Market, Toyama

near the sea. The Group's expertise in marine construction and original technology made it possible to complete the preliminary work in record time.

This HACCP approved facility houses a building equipped with water inlets that collect seawater outside the port. By taking in water from the 30-meter deep sea 150 meters offshore, fish can survive longer in captivity, because the water contains few contaminants and holds a constant temperature. The incoming seawater passes through an ultraviolet disinfecting unit, an ultraviolet filtration unit, and a water cooling unit in the building's interior and then is held in large tanks to keep fish alive and fresh until sold. The water-collecting pipes used in this state-of-the-art facility were laid using a 100-ton crane boat.


Container washing unit

The Fish Market buildings are equipped with seawater icing units, container washing rooms, air shower units, boot cleaning stations, storage refrigerators, and area hermetically sealed in order to maintain a high level of hygiene throughout the complex. The facility is visited by many and admired for its highly advanced capabilities.