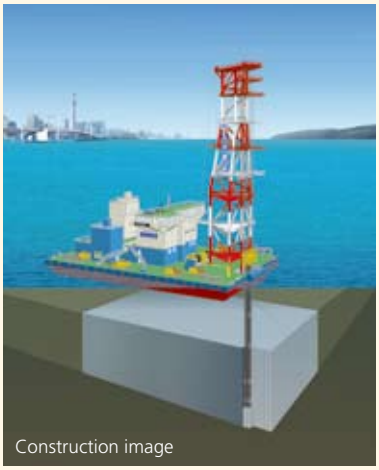
OUR TECHNOLOGIES

The Cement Deep Mixing Vessel POCM 12 completed

- A specialized vessel that improves seabed strength -


Construction image

In October 2010, the newly-built Cement Deep Mixing Vessel POCM 12 was completed.

The Cement Deep Mixing (CDM) Method is a technique to chemically solidify and strengthen soft ground in a short period by mixing cement slurry with the soil in situ. This ground improvement method does not cause subsidence of port structures, and is therefore superior in terms of seismic resistance.

The CDM Method is also considered as an environment friendly technology because of minimizing extracted waste soil, and has been applied in large-scale port and airport construction projects including the construction of Runway D at Tokyo International Airport (Haneda Airport), as well as in seismic strengthening projects for existing port structures.


Panoramic view

The new POCM 12 is a product of Penta-Ocean's experience and expertise cultivated over many years of operating CDM vessels, with the application of latest technologies featuring advanced automated control systems. This new vessel guarantees improved productivity, economical maintenance, workability and safety, and also contributes to energy conservation.

Permeable Grouting Method for Improving the Ground Directly Beneath Existing Structures while in Operation

The Great East Japan Earthquake in March 2011 led to a widespread soil liquefaction damaging many areas including wharves in Japan's Tohoku Region as well as the reclaimed land in Chiba Prefecture. Liquefaction usually occurs in loose sandy soil with a shallow ground water table, normally caused by an earthquake shaking.

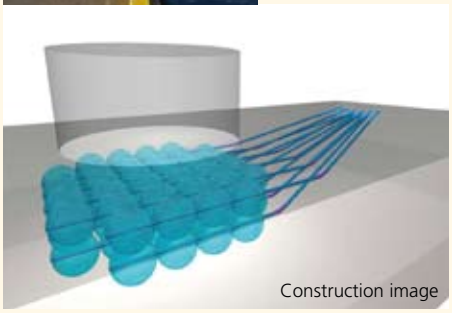
Penta-Ocean had developed the Permeable Grouting Method aiming to prevent liquefaction beneath the existing structure by injecting a permanent solvent-type grouting chemical with good permeability into the ground and replacing the pore water with a gel substance.

This method has been implemented for over 12 years now in 160 locations. It has been proven that after the great earthquake, in which many wharves were damaged due to liquefaction and/or collapse, ground treated with the Permeable Grouting Method remained stable under seismic earth pressure, as shown in the photograph to the right.

Recently, Penta-Ocean has developed a new drilling method featuring a flexible drilling technology for the Permeable Grouting Method, as shown in the figure to the right. This technology allows the drilling device to be set up beside the existing structure and injects the grouting chemical through curvature drilling beneath the structure.

This technology received several prestigious awards in the field of engineering in Japan since 2001.


An improved wharf remains in a sound state after the Great East Japan Earthquake


Construction image

Penta-Ocean's Response to the Great East Japan Earthquake

We convey our deepest sympathies to the victims of the strong earthquake and condolences to people who lost their families from massive destruction in the disaster-stricken areas. Penta-Ocean established a "Major Disaster Response Headquarters" at its head office and Tohoku Branch office in the aftermath of the earthquake to handle the distribution of relief goods, necessary equipment and supplies to the affected communities. As a mission member of the Japan Dredging and Reclamation Engineering Association, Penta-Ocean has also took part in dispatching a fleet of working vessels to help reopen the ports and speed up the restoration of port logistics.

We believe that the construction industry has a social responsibility to preserve our lands and protect the safety of our people through the manifestation of necessary infrastructure to support their daily lives.

The Penta-Ocean Group will continue to devote its full efforts toward restoration and recovery of affected areas of which we may realize a complete fulfillment being a member of the construction industry.


A salvage operation to remove obstacles swept into a harbor


A large fishing vessel that had washed ashore is removed


Transporting relief supplies from Penta-Ocean's branch offices to disaster areas