

November 5, 2019

Hitachi Zosen Corporation
TOYO CONSTRUCTION CO., LTD.
Penta-Ocean Construction Co., Ltd.

**Manufacturing of the first Seabed-type Movable Flap Gate Type
Breakwater is completed.**
- Contribution to Iwate Prefecture's Reconstruction and Disaster Prevention -

Hitachi Zosen Corporation (Osaka City, Osaka Prefecture, President Takashi Tanisho, hereinafter Hitachi Zosen) recently completed the production of a Seabed-type Movable Flap Gate Type Breakwater ordered by Iwate Prefecture (Governor Takuya Tasso) for the construction of countermeasure facility against storm surge disaster at Ofunato Fishing Port (Hosoura area Watergate 2).

It is the first production of Seabed-type Movable Flap Gate Type Breakwater which was jointly developed by TOYO CONSTRUCTION CO., LTD. (Chiyoda-ku, Tokyo, President Kyoji Takezawa) and Penta-Ocean Construction Co., Ltd. (Bunkyo-ku, Tokyo, President Takuzo Shimizu).

[Photographs at the time of completion]



(Gate size: net span 32.0m × effective height 13.0m)

The Seabed-type Movable Flap Gate Type Breakwater is a movable structure that can form water gates, breakwaters, etc. standing in a row by raising the doors installed on the seabed with buoyancy. As the water gates in the sea, it is the Japan's first seabed type and attracting considerable attention from people involved in administration of harbors, fishing ports, rivers, etc. Conventional water gate facilities are installed above sea and rivers, which limited the span and upsizing of the doors. However, this equipment is installed on the

bottom of the sea, and it is possible to protect the area of the long length by increasing the number of gates installed.

Other Features of the Equipment

- When a tsunami or storm surge occurs, the door automatically comes to the water surface by releasing the mooring hook attached to the top of the gate body.
- Since it is installed on the seabed, it keeps the landscape and ships can navigate.
- The condition of the doors can be monitored by grasping the amount of air inside. In addition, since the door body which contains the air always swings, it prevents fixation of the door body.

(Installation Example: General Roller Gate)



(Installation Example: Seabed-type Movable Flap Gate Type Breakwater)



This equipment was ordered by Iwate Prefecture as a disaster prevention measure for the Ofunato Fishing Port and its surrounding areas, which were heavily damaged by the Great East Japan Earthquake in March 2011. Following the order intake in October 2017, Hitachi Zosen has been engaged in designing and manufacturing of the facility. It will come out of Sakai Works of Hitachi Zosen in mid-November 2019 and will be transported by sea to the site in early December. The installation will be completed at the end of March 2020.

[Conceptual drawing: When the doors stay at seabed.]



[Conceptual drawing: When the doors stand up.]

